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NEWSPAPER

New Standard

Ansi Doctors, OKs Mumps

By Don Leavitt
CW Staff

NEW YORK — About a year after supporters of the Mumps language published a proposed standard for public comment [CW, Sept. 13, 1976], the document, slightly revised, has been accepted by the American National Standards Institute (Ansi).

Ansi gave its stamp of approval earlier this month and copies of the standard should be available later this year, although no decision has been made as to who will publish it, according to a spokeswoman for the organization.

Thus Mumps (originally the Massachusetts General Hospital Utility Multiprogramming System) joins a very select group of languages. Only Fortran, Cobol and PL/1 have gained Ansi's sanction prior to this. A proposed standard for minimal Basic is still under consideration.

Despite its medicine-related beginning, Mumps has been applied to a growing range of applications of a more general nature. It has also been adapted to a growing number of hardware hosts — some 18 or 20 at last count, typically in the minicomputer and small business system range.

Mumps' path to standardized status was very different from the one taken

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Push Toward Pact Slowed

U.S. 'Wins' at Data Flow Parley

By Nancy French
CW Staff

VIENNA, Austria — A platoon of nearly 50 Americans arrived here late last month to fight a battle in what one person characterized as an "economic war." And they won.

The battleground was a graceful ballroom lit by glittering chandeliers in the Redoutensaal Conference Center here, where earphone-clad troops speaking in half a dozen languages volleyed terms like "nontariff trade barriers," "data havens," "data cartels" and "increased telecommunications tariffs."

The battle itself was a meeting called "The Data Bank Panel" of the Organization for Economic Cooperation and Development (OECD) held to discuss the impact that privacy laws already enacted by 13 industrial nations could have on the flow of data across international borders.

In the end, even the summary in which Dr. F. Vaselsky, secretary of state of the Federal Chancellery of Austria, was to have called for an international agreement among OECD nations was softened because of American pressure.

In addition to a small interagency diplomatic team coordinated by the U.S. Department of State, the American contingent represented the entire spectrum of vested interests in the European data processing and communications community — from attorneys and management consultants to time-sharing and DP services companies, and from bureaucrats to college professors supported by research dollars.

The individuals, whose travel expenses were paid largely by American companies and industry organizations rather than by U.S. taxpayers, arrived agreeing on only one principle: Any international accord calling for any restriction of data transmission across national boundaries, whether for reasons of protecting individual privacy or otherwise, was either unnecessary or at least premature.

Naomi Seligman, a principal in a management consulting firm known as McCaffery, Seligman and von Simson, Inc., set the tone early by warning against the dangers of moving ahead with any sort of international

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Commission Gives Nod To Treasury EFT, Bars Bell

By Edith Holmes
CW Staff

WASHINGTON, D.C. — The National Commission on Electronic Funds Transfer (EFT) recently affirmed the U.S. Treasury Department's development of an EFT system through the Federal Reserve and effectively barred AT&T from competing in EFT services.

Meeting to adopt its final recommendations, the EFT commission opposed the Privacy Protection Study Commission by supporting the Treasury Department's efforts to speed Social Security and other federal retirement and aid payments to beneficiaries through the Federal Reserve's EFT system.

In addition, the commission concluded that AT&T cannot compete against other EFT suppliers unless a 1956 consent decree or Federal Communication Commission (FCC) rules which prohibit Ma Bell from offering services other than tariffed communications services are modified.

The EFT commission disagreed with the privacy commission recommendation that no governmental entity be allowed to own, operate or otherwise

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IBM Shuffles Price Lists

ARMONK, N.Y. — IBM Corp. has shuffled its price lists, reducing the purchase price of many key entry products, hiking certain peripheral lease costs and flip-flopping maintenance charges in both directions.

Most key entry products received price reductions in the 25% range, according to a spokesman. For example, the Model 024 card punch, which cost $1,630, will now sell for $1,225; the IBM 129 card data recorder, formerly $4,865, now costs $3,650; and the 5496 data recorder, which once cost $5,935, is now priced at $4,450.

Lease and rental charge increases of up to 10% were made on some printers and a limited number of other products, the spokesman said, citing two examples.

The monthly rental of the 1403 N1 printer is up to $1,081 from the previous $983; the same unit on a two-year lease now costs $908/mo., up from $826.

The Model 3211 printer now has a monthly rental cost of $2,000, up from the previous $1,905. On a two-year lease, the price is now $1,680 compared with the previous $1,600.

Increases of up to 8% were also made

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Few Users Planning Switch To SNA

Here is the final article in a three-part report on user attitudes toward [illegible] CPU-distributed processing and IBM's Systems Network Architecture, by Jeffry Beeler, Ronald A. Frank and Molly Upton.

IBM's Systems Network Architecture (SNA) has attracted much interest but few staunch supporters among 370/168 and 370/158 users, a *Computerworld* survey of 20 large-scale systems users has found.

In interviews with corporate DP managers and people in comparable positions, the survey found 17 companies, or 85% of the users contacted, had considered upgrading to SNA. Only two of the respondents admitted they had not evaluated SNA and one user, fearing disclosure of possibly proprietary information, refused to say whether it had investigated the product.

Yet despite their admitted curiosity about SNA, only 20% of the respondents said they had definitely committed themselves to the IBM offering, while 25% had rejected it outright and 40% expressed uncertainty about their installation plans. The remaining 15% of the users refused to say whether they intend to upgrade to SNA.

Users that have already installed SNA or plan to do so soon differed widely in the benefits they said they expect to gain from the equipment change. Some of the users predicted the product will cut their communications line costs and error rates.

Others expect to increase the variety of peripherals they can place on-line to their computers. And still others forecast that SNA will allow their terminals to perform multiple functions.

Companies that had evaluated but later rejected SNA cited doubts about the products' promised benefits as the reason for their decision. In some instances, the skeptical users admitted that their misgivings about SNA stemmed from a wariness of new products in general.

Undecided users reported for the most part that they would withhold judgments about SNA's applicability until they had finished evaluating the

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Commission Upholds Treasury EFT

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manage any part of an electronic payments mechanism that involves transactions among private parties.

Federal Reserve EFT operations can be made to meet privacy objectives by adhering to confidentiality rules and procedures at least as strict as those followed by private sector EFT system operators, the commission said.

Furthermore, access by other federal agencies to records of automated clearing house (ACH) transactions, on which the Federal Reserve EFT system is based, should also be limited by rules at least as restrictive as those for access to ACH records by private-sector financial institutions, the commission added.

While disagreeing with the privacy commission on this point, the NCEFT called "reasonable and appropriate" two other privacy recommendations. One would limit the retention of individually identifiable account information generated by EFT services. The other would establish procedures enabling individuals to promptly correct inaccuracies in EFT transaction or account records.

With regard to AT&T, the EFT commission did not take a position on whether the 1956 Consent Decree should be modified.

Based on the assumption that EFT services are data processing and not regulated communications, the commission did recommend that regulated carriers be allowed to provide EFT services, though not under tariff.

Echoing comments received by the FCC from users and members of the computer industry in connection with the Second Computer Inquiry [CW, June 13], the commission urged that if carriers do enter this DP market on a nontariffed basis, they should not be permitted to cross subsidize their EFT services with profits from monopolized, tariffed services.

Focusing specifically on AT&T in its recommendations, the EFT Commission noted that Ma Bell, "as the largest supplier of the regulated communication services industry, poses special problems.

"AT&T, on the one hand, may possess technological knowledge, research capabilities and be able to offer systems and services in EFT markets that should be available to the public," the commission said.

"AT&T, on the other hand, may possess dominant market power which could be exercised in the unregulated EFT markets in a manner which would force other firms from those markets and preclude the entry of new firms into those markets," the commission added, concluding that in the long run, this would be detrimental to the public.

Limits of AT&T

The 1956 consent decree essentially limits AT&T to operations which can be marketed under a common carrier tariff. In addition, the FCC 1971 decision at the end of its First Computer Inquiry forbids a common carrier such as AT&T from marketing DP services unless it sets up a separate subsidiary to conduct this business.

AT&T has not created such a subsidiary and there is some question whether the Consent Decree would permit it to do so.

The net effect of taking no position on the modification of the Consent Decree and of reminding AT&T of the restrictions resulting from the First Computer Inquiry is to express the EFT commission's belief that the telephone company currently has no place in the EFT services market, a commission spokesman said.

Other recommendations voted by the commission include:

- EFT terminals be deregulated as much as possible.
- The FCC registration program for direct interconnection be applied to EFT terminals using the public switched network.
- Federal and state communications regulation be applied only to "the underlying communications transmission and distribution (transparent) facilities used with EFT systems."

The group will hold one last meeting on Oct. 13-14 before presenting its work to Congress and the President.

Ansi Sanctions Mumps

(Continued from Page 1)

by the other languages, though it too was an established method.

The other languages have gone through Ansi's X3 technical committees, which typically had infrequent meetings of voluntary participants producing results only after long stretches of time, according to a spokesman for the Mumps Development Committee (MDC).

Instead of that, a number of Mumps users got together several years ago, recognized that standardization was the best way to protect the language as its implementation grew, and formed the MDC.

With good support from the National Bureau of Standards (NBS), a longtime Mumps user, the language became the first in which standard development work was fully funded.

MDC and NBS saw a need to clarify the language's three separate but related areas: a narrative description, a formal definition including charts to document syntax and semantics and portability requirements. The three parts of the standard were brought together and published in January 1976 as *NBS Handbook 118*.

In May of that year, MDC approached Ansi to determine the best route through standardization. Ansi okayed the distribution of the handbook for comment and, at the same time, for acceptance or rejection by a specially selected "jury" of some 200 people across the country.

The comment period ended late last year and Ansi considered the results of that process along with the jury's votes for or against the proposed standard.

Copies of *NBS Handbook 118* can be ordered as document C13.1:118, for $2.70 each from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

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U.S. 'Wins' at Vienna Meet

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data accord without sufficient "empirical research.

Seligman pointed out that the omnibus approach to privacy regulation originally proposed in the U.S. "presumes there are abuses in areas where there may be none and, through application of heavy-handed remedies, creates new burdens which did not previously exist.

Even where there are abuses, such an approach often fails to focus on underlying causes. Thus, she said, "the solutions offered tend to be both inappropriate and unnecessarily disruptive to the social and economic fabric," particularly in the "rapidly changing technological environment engendered by computer and communications."

Philip Onstad, speaking for the association of Data Processing Service Organizations (Adapso), likened the processing and networking services provided by Adapso's member companies to the safety deposit box provided by a bank.

The data is placed there by the customer, who should also bear the responsibility of assuring its accuracy, timeliness and fairness. The service organizations should be expected to provide no more than a secure environment for the customer's data, he said.

Harmonizing Laws

Many attendees, including representatives from Sweden, France, Austria and Germany, argued in favor of an international accord to harmonize the myriad of existing national privacy laws. Some even cited precedents for such action.

Paul Sieghart, a member of the UK's Data Protection Committee (something like the U.S. Privacy Commission), argued in favor of extending mutually acceptable rules to all "relevant countries" to eliminate worries about information processing done outside a nation's borders. Rather than restricting data flow, this "will enhance data flow," he explained.

No Terms Defined

Although the delegates struggled to present their interpretations of the hodgepodge of issues raised. The conferees seemed a long way from even defining their terms.

John Richardson, director of the U.S. Commerce Department's Office of Telecommunications, summed up the American view on the final day of the conference when he observed that the problems under discussion were not well defined. To move ahead with "corrective machinery" under these circumstances would be "risking some unnecessary or counterproductive restrictions," he said.

The Commerce Department official contended it should be the goal of the assembled nations to avoid data flow barriers without harming individuals' privacy rights.

However, he warned, protecting the property rights of legal persons – i.e., corporations – is also a factor not to be overlooked. Barriers such as exclusive regulations and tariffs will deny these rights, he claimed.

Britons in Agreement

The American view was buttressed by those of several British conferees who argued against moving ahead with an international agreement before evidence could be found to justify it.

Sir Norman Linghop, director of Hatfield Polytechnic and chairman of the UK's Data Protection Committee, compared transborder data flow to international trade, "which has been going on for thousand of years and we're still trying to regulate it."

Charles Reed, director of the interbank Research Organization in the UK, argued that the conferees – even the OECD organizers – failed to distinguish between technical developments and the uses to which they are put.

One could not assume that banks – or governments, for that matter – would use technical equipment "for evil" simply because the equipment had that potential, he said.

Vaselsky, in the summary statement in which he had been expected to come down strongly in favor of a full-blown international convention on data protection, conceded that the conference was aimed at identifying points of view rather than making decisions.

The issue of privacy "is one of human rights," he said. The individual shouldn't be at the mercy of those who control information, but "a bridge doesn't build itself; market forces on their own won't solve the problem."

It's up to the democratic, industrialized nations "to build the bridge and reach a consensus," he said.

Onerous Restrictions

By Nancy French
CW Staff

VIENNA, Austria – A number of countries may place restrictions in the near future on the recording and foreign location of certain types of personal files as well as the transmission of certain data across national boundaries.

According to the organization for Economic Cooperation and Development (OECD), possible restrictions that could have some onerous implications for a multinational corporation or a firm in the data services industry include the following:

- Data banks shall not include information on a person's race, opinions, political activities, trade union membership, medical condition, alcoholism, criminal offences, confinement for mental disorders, discharge from the armed forces or forfeiture of civil rights.
- Credit bureaus for citizens of a country may not be operated outside its territory.
- Special requirements would be placed on the use of personal data in advertising, direct mail, credit bureaus, insurance organizations, etc., for internal processing and transmission abroad.
- No organization domiciled in one country shall use data processing facilities abroad unless all provisions applying to domestic processing are observed in the other country concerned.
- If data is to be processed abroad, it may be transmitted only when it can be assumed that disclosure will not entail undue encroachment of privacy.
- Data banks shall not transmit personal information abroad unless special authority has been given.
- Exporting collections of personal records will be forbidden except under license.
- The organization in charge of a data base shall keep a copy of all data transmitted to a foreign country.

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Police System Proves Transfers Can Be Made

By Don Leavitt
CW Staff

READING, Pa. – "From Pueblo to Reading to Allentown" sounds like a baseball double-play combination, but it really outlines the route followed by a police information system that was built from the ground up with transfer in mind.

Since the system has already been transferred once, there seems to be no major problem standing in the way of moving it to other police forces, according to Rod Steffy, the Reading detective who manages the system here.

At the moment, the local police department has the system up and running on its Univac 90/30 and is getting ready to transfer it to Allentown, and perhaps other cities, in northeastern Pennsylvania. But the story started in Pueblo, Colo.

Project manager William Langendoerfer, a civilian with the Pueblo police, worked closely with Univac in 1975 to develop a definition of need and to gain a grant from the Law Enforcement Assistance Administration (LEAA).

The system Pueblo envisioned was to provide on-line access to a master name index and a "wants and warrants" file, as well as being the backbone of a dispatching operation. It was to be written in Cobol wherever possible, using top-down structured programming techniques.

Two programs supporting a phonetic name search were written in BAL for efficiency, but otherwise Cobol prevailed. Designed around Univac's IMS/90 OS/3 environment, it was developed by four people in just about a year, Langendoerfer recalled.

The development team included two local people and two from Univac. The Univac portion of the effort amounted to more than $250,000 in manpower costs and that, in Langendoerfer's opinion, was "very unusual" support for a system intended for such modest hardware as the 90/30.

Since the software was to be given away to any other police force that needed it, Univac probably saw a potential for selling a number of CPUs if the system worked well, he acknowledged.

In February, 11 months after Pueblo installed its system, the same hardware/software combination was delivered to Steffy and the police force here. Because of the planning that preceded the Colorado implementation, Langendoerfer had nothing to do to make the software ready for Reading.

Steffy and his colleagues have made some modifications and he expects more as the system is adapted to local needs, but he said only "minimal effort" on the part of a recipient is needed to make the system work.

As was the case in Colorado, Steffy also welcomed support he's received from his chief of police and the mayor of the city. Without that kind of backing, no system will be really effective, Steffy and Langendoerfer agreed.

The only real problem Reading had as the system was implemented was acclimating the police officers themselves to work with the on-line facilities. Now, however, they have accepted it and the terminals, especially in the detective division, are being well used, Steffy noted.

System Extension

Reading has been extending the system received from Pueblo to include, among other things, a gun registration subsystem, an offenses and incidents file, traffic violations and support for crime prevention. But Steffy said they haven't really been able to absorb all these enhancements.

A "real desire to transfer the system" on the part of the recipient is pobably the biggest prerequisite to success, Russ said. In discussing the situation further, however, he suggested good rapport between donor and recipient is equally important.

He noted, for example, that both he and Steffy – and various others he contacted in other police departments – are ex-Marines.

Langendoerfer laughed when he heard about the "Marine connection," explaining that as an ex-Navy man he was used to supporting the leathernecks, but he hadn't thought it would carry over to his civilian work.

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Survey Finds Few SNA Converts Among Users

(Continued from Page 1)

product and had had an opportunity to review their findings.

Elsewhere in the survey, CW found that all the users contacted had installed some form of computerized data communications network but that the characteristics of those networks varied widely.

Twenty percent of the respondents reported they had built their networks around remote job entry (RJE) terminals. Ten percent of the users said they had installed an interactive network, and 50% described their nets as a mixture of RJE and interactive capabilities.

The remaining 20% declined to give details about their data communications setups.

Asked to explain why his company rejected SNA, William Caldwell, operations manager for Amoco Production Co., said officials at the Tulsa, Okla., firm doubted the product could live up to IBM's performance claims.

Northwestern Mutual Life Insurance Co. used a similar argument to justify its rejection of SNA, according to Jeff Dunn, the Milwaukee firm's assistant DP director. Dunn said his company considered upgrading to SNA at one time but added that he has learned from experience to be wary of new products, IBM's or otherwise.

The Aluminum Co. of America (Alcoa), on the other hand, decided against upgrading to SNA primarily because the Pittsburgh-based firm does not mix data processing applications on its terminals, technical services manager R.N. Wehling said. For this reason, the company concluded it would benefit little from upgrading to the IBM product.

Alcoa officials also decided they could use a cluster of CRT terminals to effectively duplicate an SNA-based system, Wehling added.

D.L. Campbell, director of PPG Industries, Inc.'s computer center in Pittsburgh, offered a different reason for his company's opposition to SNA. "Frankly, I don't like it," he complained. "I think it's too restrictive in IBM's favor. It represents an attempt to create an all-IBM environment in the computer room, and in this day and age I don't think IBM can pull that off."

Those in Favor

Other 370/168 and 370/158 users, however, voiced opinions just as strongly in favor of SNA. The Joseph Schlitz Brewing Co., for example, expects the IBM product to yield lower communications costs, lower error rates and improved line discipline, according to R.L. Babcock, the Milwaukee firm's information processing manager.

Babcock also predicted that with SNA the company's 370/168 will not need a byte channel "if we get everything into a hardware environment that will operate on a block channel." To capitalize on these expected benefits, Schlitz has already begun to implement SNA at its corporate headquarters, Babcock added.

Blue Cross/Blue Shield in Richmond, Va., is even further along in its installation schedule, having upgraded to SNA several months ago, operations manager Leo Harris, reported. As a result of this product move, Blue Cross/Blue Shield officials expect tobe able to attach a wide variety of peripherals to their 370/158, including floppy disk drives, CRT terminals and teleprinters.

'No Discernible Benefits'

Oscar Mayer Co. also has already upgraded to SNA, but computer manager Roger Tietz conceded that the installation thus far has yielded no discernible benefits. As state-of-the-art technology, however, he predicts the product will eventually allow the Madison, Wis., firm to link more than one remote site to its central data file.

Tietz regards SNA's newness as its primary drawback. "It doesn't always work," he noted.

Meanwhile, in the data communications part of the survey, users gave a wide variety of responses when asked to describe their hardware configurations. Schlitz, for example, operates three communications networks, Babcock said.

The first is a time-sharing system that links about 40 remote terminals to an IBM 370/168. Those terminals include a mix of IBM 3277 and Tektronix video displays plus several Anderson-Jacobsen, Texas Instruments and Decwriter hard-copy machines.

The second Schlitz network incorporates eight IBM 3276 RJE terminals at the company's remote plants. These terminals link to the firm's central 370/168 in Milwaukee over leased communications lines.

Schlitz's third data communications net is a wholesaler information system that connects the central mainframe by Wats lines to ITT Ascii-Scopes at 300 wholesaler sites.

More Multiple Nets

Ashland Oil Co. also operates more than one communications net. Two of the Ashland, Ky., firm's sites perform RJE applications, while a third network uses Sycor terminals to do interactive jobs, according to Stan Wonn, the company's administrative assistant for computer science and services.

Those terminals include Model 350s, 351s, 250s and 257s, Wonn added.

At Chase Manhattan Bank's trust department, a Control Data Corp. Cyber 1000 message-switching center connects to 200 remote sites equipped with Model 37 teletypewriters. Chase also plans soon to connect its 370/168 to the Swift banking network, senior vice-president William Shine reported.

Chase's communications vehicles include leased lines and satellite transmissions with switching networks in Hong Kong and Tokyo.

IBM Makes Price Revisions

(Continued from Page 1)

for certain maintenance and support services, while some monthly maintenance fees decreased up to 20%, the spokesman said.

Monthly maintenance for the System 3 Model 4 has gone up approximately 10% from $145 to $160.

Systems engineering has also increased with General Systems Division systems engineering costing approximately 15% more and DP Division systems engineering costing 10% more.

Education fees for certain customer education courses have gone up approximately 15%, the spokesman added.

In other typical maintenance price decreases, upkeep for a 370/155 with 512K bytes of main memory was reduced from $2,065/mo to $1,860/mo. The 370/165 maintenance was reduced 5%, all of System/7 maintenance was reduced 10% and System/3 models 6 and 8 maintenance was reduced 5%. The Model 15 maintenance was reduced 10%.

The price changes reflect a normal business review, the spokesman said.

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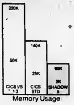
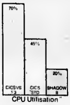
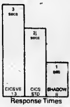


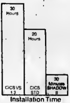
Memory Usage



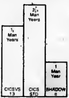
CPU Utilisation



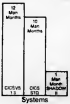
Response Times



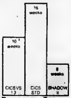
Installation Time



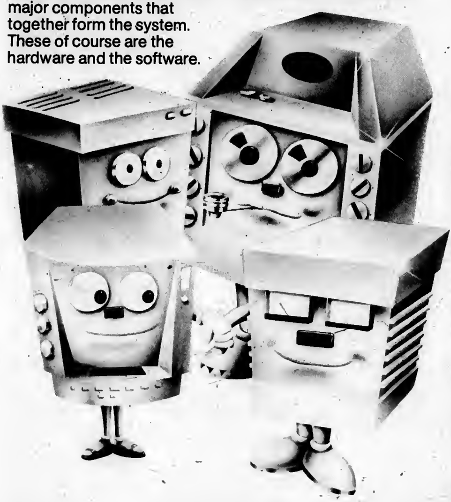
Application Development Time



Systems Programmer Time For Maintenance



Programmer Training and Learning Curve



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Lists First-Year Priorities

Afips Suggests Study Areas for Congress' OTA

WASHINGTON, D.C. — The Congressional Office of Technology Assessment (OTA) should tackle such issues as standards, legal protection for software and data bases, privacy and security in its first-year study of telecommunications, computer and information policies, according to the American Federation of Information Processing Societies (Afips).

Afips is participating in an OTA planning study to determine just where the Congress' technology adviser should spend its money and manpower in the information technologies. The federation also recommended that a first-year program include assessments of electronic mail, electronic funds transfer systems (EFTS) and new applications and techniques resulting from the convergence of computer and communications technologies.

Afips is one of several members of a working group on telecommunications, computers and information established by OTA to hammer out those issue areas the congressional office should initially examine.

The working group met here for the first time last May with 75 people attending. It includes such interested parties at AT&T and IBM, consultant firms such as the Rand Corp. and Arthur D. Little, Inc. and selected executive agencies including the Federal Communications Commission and the White House Office of Telecommunications Policy.

Kennedy Proposed

The original proposal for a fully funded OTA information technology assessment came from Sen. Edward M. Kennedy (D-Mass.) who, in January, suggested that OTA assess the development and application of information technology from 1977 to 1990, an Afips spokesman said.

The Congressional Board of OTA, chaired by Kennedy, devised the planning study and funded it with $75,000. Dr. Leland L. Johnson of the Rand Corp. is serving as an OTA consultant and is responsible for putting the working group's recommendations into a coherent report to the board on what should be done to inform members of Congress about developments in the information technologies.

"Relevance to congressional concerns will govern the selection of projects to be undertaken by OTA," Johnson said. In the midst of his draft report to the OTA Congressional Board, he added that his sources are the May working group meeting, surveys of public materials, informal conversations with individuals and organizations in Washington and Afips' formal proposal.

Technology List

In hopes of meeting congressional concerns, Afips has proposed a list that emphasizes the immediate information technology issues facing the legislature. Not only do budgetary constraints necessitate a limited OTA program, but the "dynamic change" that the computer and communications technologies are undergoing makes specific predictions beyond 10 years "conjectural and of somewhat dubious value," the federation noted.

". . . In its next session Congress will likely consider legislation related to national telecommunications policy, electronic banking, electronic mail, privacy, computer and telecommunications security, computer crime, standards and copyright protection for computer programs," Philip S. Nyborg, Afips' Washington office director, wrote in a letter to Johnson.

"Clearly, these policy issues have major technological components, and Congress will have substantial need for a credible, accurate and independent source of technical information," he said.

Best Approach

From the viewpoint of Afips' constituent societies, Congress would be served best by an OTA which gives its memebers an independent basis on which to make legislative decisions in technical areas, Nyborg stressed.

If OTA has money left over after delving into projects recommended by Afip[illegible] primary consideration, the congressional office should then examine the adequacy of existing computer systems audit and control techniques, educational technology and alternative regulatory approaches regarding offerings of mixed communications and DP services, the federation said.

While Afips recommended that every project selected for study by OTA specifically relate to either pending or proposed legislation or to congressional oversight responsibilities, the federation also urged sufficient OTA budget flexibility to permit the office to alert Congress to issues emerging in the information technologies.

Johnson said he considered Afips' proposal authoritative because it represents a consensus of this group of experts. The OTA consultant called it "an important input into the larger report."

That larger report should be presented to the Congressional OTA Board sometime before the end of this month.

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IBM Designed to Monopolize: McAdams

By Catherine Arnst
CW Staff

NEW YORK — It was IBM's intent to monopolize — not its "skill, foresight and industry" — that caused the firm to develop new products, an economist testified at the U.S. vs. IBM antitrust trial recently.

Dr. Alan K. McAdams, the Justice Department's chief economic advisor for this case, used the phrase "skill, foresight and industry" as a shorthand economic description of actions a firm takes that are motivated solely by the desire to benefit the consumer.

Although IBM may have a reputation for those types of actions, the company actually has introduced most of its product changes and price cuts out of a desire to contain competition, McAdams claimed.

His analysis is crucial to the government's case because it is part of its attempt to prove that IBM had an intent to monopolize the computer industry. Section Two of the Sherman Antitrust Act, under which this suit was brought, requires that intent be shown, and it is often the proof of such intent that is the most difficult aspect of an antitrust case.

'Fighting Machines'

The government spent 10 weeks last fall presenting the "fighting machines" portion of its case [CW, Oct. 11, 18], which McAdams cited in support of his conclusions. "Fighting machines" were those systems IBM allegedly announced and for which it prematurely took orders in order to undermine competitive systems. In some cases, such as with it's time-sharing system, IBM never filled its promises, the government claims.

The government specifically accused IBM of using this technique with the 360/90, 67 and 44 computer systems. McAdams also used the example of the 370/125, announced in August 1972, as a machine IBM announced only to solidify its monopoly position.

The 370/125 was designed to impact Memorex Corp., which was then expanding into the systems market, McAdams said. Memorex had already cut into IBM's installed disk drive base and the firm wanted to keep the newcomer from expanding any further, he testified.

The 125 was announced with a virtual operating system, a first for IBM. This meant it required new peripherals, as the old ones would be incompatible. This was a departure from IBM's original plan to make all 370 systems' interfaces compatible in order that users could switch systems easily.

The result was that none of the disk drives manufactured by plug-compatible peripherals manufacturers could interface with the new IBM system, and a new design effort had to be mounted by these firms, McAdams said. It was IBM's plan when it announced the 125 to impact the plug-compatible firms, and particularly Memorex, when it announced this system, he said.

IBM ran into a number of problems with the 125 and the CPU had to be redesigned after the announcement was made, McAdams said. In addition, the system was ready before IBM completed its new disk drive which would provide unique capabilities, according to IBM promises, he continued. Users eventually had to wait over a year before they could receive all the features they were promised with the 125, he said.

The 125 was considered "an absolute disaster," according to one internal IBM document, but it did succeed in putting Memorex out of the systems business, McAdams said. The 125 product strategy was evolved to impact competitors, it degraded product capabilities and IBM failed to meet its promises. However, it was a success in the sense that IBM was able to maintain its monopoly position, he said.

Although IBM did not use "skill, foresight and industry" when planning new products, it did gain such a reputation because it was able to outpromise everyone else, McAdams said. IBM could not live up to its promises, but by making them, it forced other firms to make inflated promises also, he added.

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Town Wins Funding Settlement; DP Exonerated

By Ann Dooley
CW Staff

WORCESTER, Vt. — Denied federal funds because of an alleged computer error, this town sued the Economic Development Administration (EDA) and funds were restored in an out-of-court settlement.

Worcester town officials got the funding restored by proving that there was no computer foul-up and that federal officials "took the easy way out" by substituting zeros for unemployment figures that would have made the town eligible for funds.

The $4 billion federal public works jobs program, designed to alleviate unemployment around the country, was based on unemployment levels in each city and town.

Since no federal statistics are compiled for unincorporated towns or those with a population of less than 2,500, the EDA simply assigned a zero to those towns — instead of using local statistics as ordered by the federal government.

The zero automatically disqualified such towns from receiving any public funding under the program.

Officials of Worcester, which has an unemployment rate of 13%, were surprised to receive no funding while neighboring towns received more than they requested. They asked Tom Evslin, an employee of the software development firm Solutions, Inc., to investigate the matter.

Evslin was first told that it was a computer error which could not be fixed. Then, using the Freedom of Information Act, he requested background materials from DP people in the agency, who then sent him printouts and showed him their programming instructions.

The printouts indicated the programming was correctly done but that the instructions given the programmers were not in compliance with the law.

When the town learned this, it brought suit.

16 Suits Filed

Sixteen such suits have been filed against the EDA, but Worcester — population 700 — is the only one so far to win its case, according to Evslin.

The town was awarded $364,000 and plans to use the money to build an addition to the elementary school. Worcester was joined in the lawsuit by three neighboring towns for a total joint settlement of $535,000.

The EDA settled out of court because it didn't want to set a precedent, according to Evslin. The case "is an open admission that EDA is wrong," according to Robert Pope, attorney for seven towns in North Carolina involved in a similar suit.

But the EDA contends the decision was only the opinion of one judge and that the agency will take all its other cases to the Supreme Court if necessary, according to Evslin.

What the whole thing amounts to is that the EDA didn't want to bother with the small towns and pinned the blame on the computer, he said. However, as in many such cases of alleged computer error, it turned out to be the human factor which caused the problem, he added.

"The only way we succeeded where other towns haven't is that we had a knowledge of computers and a knowledge of the Freedom of Information Act," Evslin said.

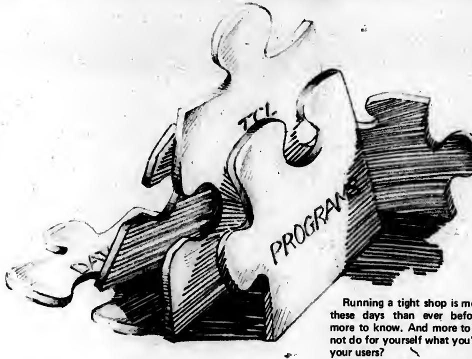
The printouts showed the zeros were invented and not observed, the rules were not being followed and the computer was being used as a smokescreen, he said. In addition to the computer knowledge; someone in town worked for a congressman and knew how to avoid the red tape in the Freedom of Information Act, he said. That way the information was received in less than a month, he added.

Few small towns have that combination of expertise, he noted.

"Now we have the information to help any town win its case," Evslin said, although it's probably too late to help any community that hasn't already filed suit. The deadline for allocations by the EDA is Sept. 30.

"No one knows what will happen if the suits aren't settled by then," he said adding many towns are still unaware of what happened to them.

Get It All Together...



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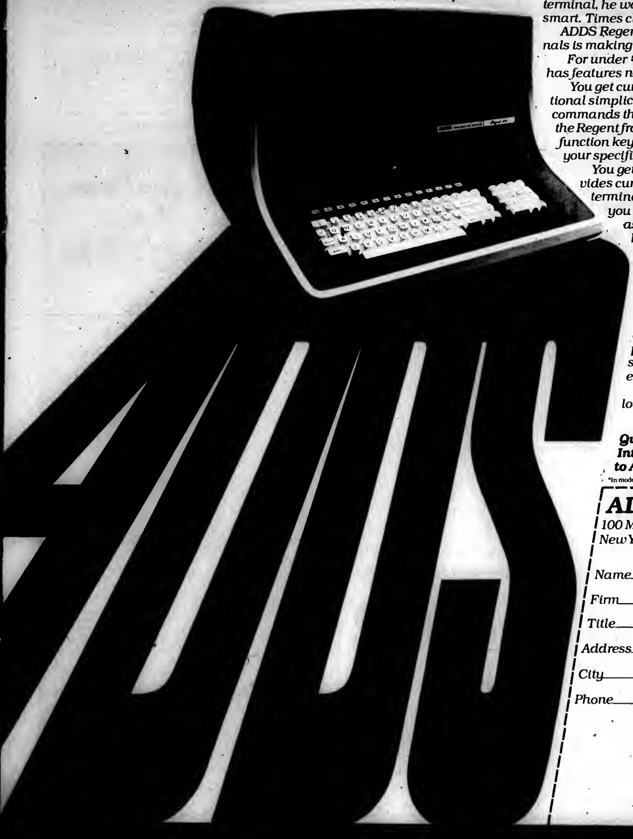

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Users 'Sour' on NCR Maintenance Proposal

By Toni Wiseman
CW Staff

While the status of NCR's new maintenance policy remains uncertain, users interviewed recently were unanimously disturbed, negative and "sour on the deal" NCR is proposing — a virtual halt to user-to-user sales since there are no longer any guarantees of maintenance [CW, Sept. 5].

The users said they had not yet seen anything purported to be a final draft of the policy. However, they had received, from various sources, copies of an Aug. 5 NCR marketing communication from E.F. Shipman, senior vice-president of domestic marketing, to all regional directors and district managers. The memo outlined NCR's intentions and, at this time, those intentions stand as the rules by which all field offices must operate until further notice, according to one user.

Shipman's Memo

The NCR memo stated, "It is NCR's intent to support our customers in their use of NCR equipment. We do not intend to support non-NCR competitive equipment added to NCR systems, nor can we support unauthorized modifications to NCR equipment.

"The primary purpose of NCR's Field Engineering Division is to support the marketing effort and strategy of the NCR Marketing Division, and we feel no obligation to support the marketing efforts of others."

Several users view this as a clear move to put brokers and third-party firms out of business.

Frank Kolebuck, DP manager for La-Z-Boy Chair Co., noted, however, that there are really only three dealers doing any volume of business in NCR equipment — Harwoods and Associates, Computer Connection Corp. and Computer Enhancement Corp.

Another area of concern is the flat rate for the prerequisite "review" of used gear prior to certification for maintenance. Shipman's memo stated that "Installation and certification prices will be 50% of the established Zone 1 maintenance rates. This one-time charge to the customer will be made to cover the expense of cabling the unit or system, physical and technical inspection, diagnostic procedures, replacement of defective modules, installations of any applicable modifications and other work required to place the equipment in acceptable condition for reliable operation. The replacement parts and/or modules will be charged to the customer."

NCR has assured users this policy is in their best interest, in the event of serious problems with the equipment. Kolebuck observed, however, that on a printer La-Z-Boy had installed, the flat rate was $2,800 for a job he said anyone could do in two days or less. "Even if the time and materials fee were $65/hour, it would have only cost $1,000," he said.

Jon Pershing, DP manager for Dunn-Edwards Corp., said he was "definitely flat against anything of this nature. It completely voids the value of the equipment we own."

He added his superior had voiced the opinion that the policy is possibly an illegal contract and therefore will not be enforceable. If it can be enforced, however, Dunn-Edwards would be hesitant about buying further NCR equipment, though some might be leased. NCR has been its vendor for eight years, he said.

William Henderson of the First National Bank of Lake Forest feels NCR is justified in taking this stand, but does not think the firm will ever make it work.

'Close to Zero'

Henderson said his initial reaction was "Hey, you just dropped the value of my system close to zero." The reason behind his statement was he has neither the contacts nor the time to go through sales negotiations while there are well qualified people all across the country who know NCR equipment and know where potential purchasers for his equipment are.

He noted he had previously purchased equipment from brokers, but had always been careful to get the serial numbers and "get it in black and white from NCR that they would put this equipment on a maintenance policy for me."

Henderson said he would still buy used equipment under the "unofficial" policy, with NCR's full knowledge, "but I just don't think they can back this policy up."

Many of the users, including Hani Durzy of First Bank Corp., feel the policy takes the buyer into consideration, but not the seller. The Catch-22 is that in most cases the seller is also a buyer, since most equipment is bought and sold as replacements.

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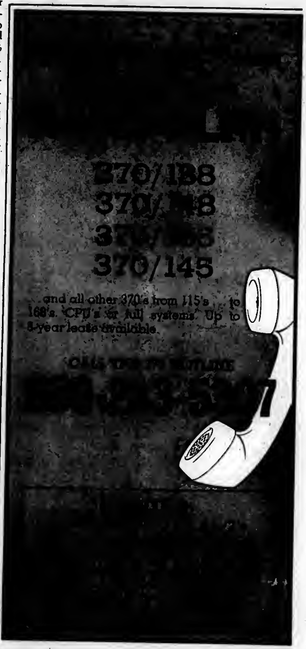

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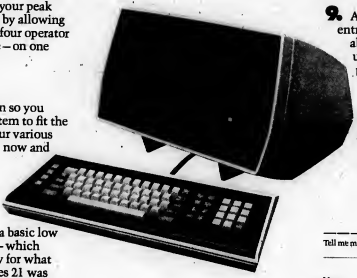

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More Jobs, Efficiency Urged for French DP

By Nancy French
CW Staff

PARIS — Although data processing has made sweeping changes in the everyday life of the Parisian; few Frenchmen outside this capital city are even aware that the computer exists, according to Rene Monory, minister of industry, trade and crafts.

Speaking here last week at the opening of the Convention Informatique, an annual conference that attracts a crowd of about 2,000 from France and French-speaking countries, Monory emphasized the theme of bringing DP under control.

Control means providing more jobs in DP without increasing the rate of unemployment among unskilled workers, many of whose functions the computer will assume, he said.

It means decentralizing the concentration of computers in the Paris metropolitan area, where 70% of the installations are located, and helping existing users increase their efficiency and reduce costs.

The government alone, which accounts for 40% of all data processing activity in France, aims to cut implementation costs by half and save 10% to 15% on existing installations, he added.

In his speech, delivered in French and translated simultaneously into English, Monory noted the DP industry is a vital element of the French economy, responsible for a "turnover" of 10.5 billion francs per year. It employs 65,000 individuals and accounts for 40% of the nation's exports, he said.

Last year, the installed base of computers in France was valued at 32 billion francs, up from 17 billion francs in 1972. The value is expected to reach 64 billion francs by 1980, according to Monory.

Sources here believe that goal is achievable largely because most small and medium-sized companies in the nation are not yet computerized. As Monory pointed out, more than two-thirds of all computers are located in Paris, which accounts for only 20% to 30% of the nation's population.

Government Role

Monory attributed the success of the French DP industry to the government's role in restructuring the marketplace through support of CII/Honeywell Bull, which now claims an estimated 28% of the nation's installed base of large computer systems. Fifty percent of all large installations are still IBM, and it is this nation's goal to overtake IBM here by 1980, he said. This goal, too, is believed to be within reason, sources said.

At the moment, leftist politicians are squabbling over whether CII/Honeywell Bull should be nationalized. If a leftist coalition should come to power in France's elections next March, CII/Honeywell Bull might be among the firms that could face the prospect of being taken over by the government. That prospect seems unlikely now, but observers here were somewhat less confident a short time ago.

The French government is pursuing a three-pronged policy toward this nation's computerization. First, it is promoting DP within the administration — or civil service — as a means of guaranteeing the existence of an autonomous national DP industry and maintaining a favorable balance of trade.

Second, it is seeking better ways for the government to process its data and develop new applications. And finally, it is encouraging small- and medium-sized companies to use computers.

According to Monory, the software firms "should be the motor behind the drive to computerization," for only they can capitalize on the experience of each user and disseminate the results, he said.

This is the first time the French service industry, whose revenues are second only to those of services in the U.S., has been given official recognition as a major factor in the computerization of France, sources said.

In conjunction with this, Monory said he plans to create a national center for DP experiments and applications to carry out, on demand, studies on cost performance for large government systems.

Removing the rose-colored glasses.

A realistic look at *Data Base Management Systems* in the October 31st *Computerworld*.

In the ten years since Data Base Management Systems were introduced they've grown to a multimillion dollar subindustry in their own right. As late as 1973, less than 1,000 DBMS were installed; but International Data Corp. estimates that over 5,000 are in use today, and this number will increase to 8,200 in the next two years. This phenomenal growth has been fueled by the hoped-for benefits of DBMS, which include increased programmer efficiency, the elimination of redundant information in the data file, and greater ease in coping with system upgrades and reprogramming.

But a data base management system should be evaluated carefully before you commit to purchase. They have developed such a reputation as problem solvers that people tend to expect more from them than they can achieve, while overlooking or minimizing the effort required.

We'll have several experts on hand to help you arrive at a realistic understanding of DBMS in our October 31st special report edited by Don Leavitt. Here is a sampling of the kinds of articles you'll see:

- Combatting the "Holy Grail" syndrome — Being realistic about the benefits that are possible in relation to the effort required; how to assess whether DBMS will enable you to reach your goals.
- How well are installed systems living up to expectations? A review of typical problems that need to be overcome.
- The role of the Data Base Administrator in DBMS — including considerations like the physical arrangement of the data base.
- How dictionary packages, report writers, etc. interface with DBMS software.
- A review of selection criteria and the implementation process.
- How DBMS ties in with distributed data processing — matching intelligent front ends with intelligent back ends, for example.

As this short preview shows, our special report on Data Base Management Systems in the October 31st issue will interest people who are considering DBMS, as well as people who already have one installed. And if you market Data Base Management software, remember that your ad will reach more of your primary audience here. Ad closing date is October 14. Your *Computerworld* salesman has all the details. Or call Terry Williams at (617) 965-5800 to reserve space for your ad.

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Stop for a minute and think about what that means to your current and future plans for using 3270-type data entry devices. It means seven benefits that would otherwise be unobtainable anywhere.

First, it means you can build a 3270 network virtually overnight, regardless of your current processor model or software system, and without any front-end hardware or software. A PIX-II local controller installs on you CPU's byte multiplexer channel, taking the place of a 3272 local controller. A PIX-II remote controller installs at each remote site, with a 3272 local controller. The 3271 remote controller is eliminated. The installation takes a day, requires no software modification, and gives you—immediately—a completely operational 3270 network.

Second, that installation now puts all of your 3277-type terminals in local mode, as if they were right at your host CPU site, attached to a byte MUX channel.

Third, now that your CRT stations are in local mode, polling is totally eliminated. Every 3277 is served on a demand basis, as if it were the only terminal on the network. Nor is there any need for polling software overhead. You don't need it.

Fourth, the result of this systems configuration is improved response time for every 3277, regardless of its location. On average, that improvement will be about four times better than what you now achieve: from an average of eight seconds, to just under two seconds. For *every* 3277, consistently.

Fifth, no remote terminal access software is needed. None. No remote BTAM or remote TCAM if you operate under non-virtual methods. No VTAM and related NCP front-end software (there is no front-end) if you operate under virtual technology. That feature alone saves you months of effort.

Sixth, whether you operate under bisynch or SDLC now, PIX-II immediately gives you all of the benefits and speed potentials of SDLC, with no development work required. None. The PIX-II data link operates at speeds up to 56KB, so all you have to do is specify the type and speed of communications link—from a 1200 baud leased line to a 56KB satellite link. PIX-II takes it from there.

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You'll also like the price. PIX-II costs less than the equipment it replaces—far less in some cases. Its greatest virtue, however, is that it lets you do right now what you'd like to do right now—with virtually no effort required.

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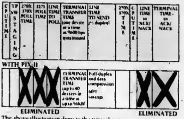
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Three Special Sessions Set At Info/Expo Next Week

WASHINGTON, D.C. — State software taxation, privacy and software acquisition management will be spotlighted in three special sessions during the Data Processing Management Association's (DPMA) Info/-Expo '77 conference here Oct. 9-12.

Robert Sherin, president of Nova Computing Co., will moderate a software taxation seminar Oct. 10 from 7 p.m. to 8:30 p.m. The seminar will discuss the current status of software sales tax legislation and its impact on computer operations.

The privacy session, entitled "An Analysis of the Impact of 1977 Privacy Legislation," will be held Oct. 11 from 6 p.m. to 9 p.m. and will consist of a panel discussion.

Panelists will include Robert Smith, editor of "The Privacy Journal;" Carole Parsons, executive director of the federal Privacy Protection Study Commission; Donn B. Parker, senior consultant, Stanford Research Institute; Wright Andrews, partner in Sutherland, Asbill & Brennan, a Washington law firm; and the DPMA's international vice-president, George R. Eggert.

"Software Acquisition Management for Department of Defense Command Control Communications Systems" is the title of the third seminar Oct. 11 that will take place between 3 p.m. and 5 p.m.

Those attending Info/Expo can attend the seminars free of charge. Further information on the conference is available from the DPMA at 505 Busse Highway, Park Ridge, Ill. 60068.

SCDP Slates Oct. 13 Meet

MEMPHIS, Tenn. — The Society of Certified Data Processors (SCDP) has scheduled its annual conference for Oct. 13, in Washington, D.C. — immediately following Info/Expo '77, sponsored there by the Data Processing Management Association (DPMA).

The one-day SCDP conference at the Washington Hilton Hotel will focus on "The Future of the Certificate in Data Processing."

Speakers will include Fred Harris, past president of the Institute for the Certification of Computer Professionals (ICCP); Beverly Madron, acting president of the DPMA's provisional special interest group on the Certificate in Data Processing; Kenniston W. Lord Jr., past SCDP president; Dr. G. Gary Casper, president of ICCP and SCDP; and Jerry J. Martin, ICCP treasurer and SCDP vice-president.

The registration fee of $50 includes the conference, luncheon and hospitality suite. Further information is available from Tommy Briggs, SCDP, Suite 532, 2670 Union Ext., Memphis, Tenn. 38112.

Calendar

Oct. 13, Washington, D.C. — **Seminar on DP Auditing: Should the Public Depend On It?** Contact: Paul McEwen, U.S. Department of Treasury, Bureau of Alcohol, Tobacco and Firearms, Office of Inspection, P.O. Box 6199, Washington, D.C. 20090.

Oct 17-19, New York — **ISC Security East Conference.** Contact: Executive Director, International Security Conference, 2639 S. LaCienega Blvd., Los Angeles, Calif. 90034.

Nov. 1-3, Los Angeles — **Interface West Conference,** Contact: Interface West, 160 Speen St., Framingham, Mass. 01701.

Nov. 1-3, Woburn, Mass. — **New England Printed Circuits and Microelectronics Exposition,** sponsored by Industrial & Scientific Conference Management, Inc. (ISCM). Contact: Vic Pariso, ISCM, 222 West Adams, Chicago, Ill. 60606.

Nov. 1-3, Detroit, Mich. — **CAD/-CAM V,** sponsored by the Computer and Automated Systems Association of the Society of Manufacturing Engineers (SME). Contact: Exposition Department, SME, 20501 Ford Road, P.O. Box 930, Dearborn, Mich. 48128.

Nov. 1-3, San Francisco — **1977 Business Equipment Show,** sponsored by the Administrative Management Society. Contact: Cartlidge & Associates, Suite C. 415 Clyde Ave., Mountain View, Calif. 94043.

Nov. 1-3, Chicago — **Second Conference on Designing to Survive Extreme Disasters.** Contact: Keith McKee, Conference Co-Chairman, IIT Research Institute, 10 W. 35th St., Chicago, Ill. 60616.

Nov. 2, Hartford, Conn. — **Meeting on Documentation Management.** Contact: Paul Fitterer, The Torrington Co., 59 Field St., Torrington, Conn. 06790.

Nov. 2-3, New York — **Seminar on Computer Security Survival,** sponsored by the Association of Data Processing Service Organizations (Adapso.) Contact: Joseph Hoey, Dataguard, 733 Third Ave., New York, N.Y. 10017.

Nov. 2-5, Dearborn, Mich. — **Annual Convention of the National Association of Users of Computer Applications to Learning.** Contact: John S. Camp and Lary Smith, Conference Co-Chairmen, Wayne County Intermediate School District, 33500 Van Born Road, Wayne, Mich. 48185.

Nov. 3, Boston — **Electronic Funds Transfer: The Commission Report and Beyond,** sponsored by the Computer Law Association. Contact: Robert Bigelow, Room 2200, 28 State St., Boston, Mass. 02109.

Nov. 3-5, New York — **Eastern Regional Operations & Automation Workshop,** sponsored by the American Bankers Association (ABA). Contact: ABA, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

Nov. 6-9, Houston — **Bank Administration Institute (BAI) 53rd National Convention.** Contact: BAI, Meeting Services Division, P.O. Box 500, Park Ridge, Ill. 60068.

Nov. 7-11, San Francisco — **On-Line Network Systems and Data Base Systems Conference,** sponsored by the American Institute of Industrial Engineers (AIIE). Contact: AIIE Seminars, Department PR, P.O. Box 3727, Santa Monica, Calif. 90403.

Nov. 8-10, London — **Compek UK 1977,** computer peripherals exhibition. Contact: Iliffe Promotions Ltd., Dorset House, Stamford St., London SE1 9LU, England.

Nov. 8-11, Chicago — **Compsac '77,** sponsored by the Institute of Electrical and Electronics Engineers. Contact: Compsac '77, P.O. Box 639, Silver Spring, Md. 20901.

Nov. 8-11, Toronto — **1977 Canadian Computer Show.** Contact: Derek A. Tidd, Show Manager, Industrial and Trade Shows of Canada, 481 University Ave., Toronto M5W 1A7, Canada.

Nov. 9-11, Toronto — **Office Efficiency Show,** Contact: Derek A. Tidd, Industrial and Trade Shows of Canada, 481 University Ave., Toronto M5W 1A7, Canada.

Nov. 9-11, Lubbock, Texas — **Institute of Electrical and Electronics Engineers (IEEE)** International Pulsed Power Conference. Contact: Dr. T.R. Burkes, Department of Electrical Engineering, Texas Tech University, Lubbock, Texas 79409.

Nov. 10, Akron, Ohio — **Minicomputer Conference & Business Show.** Contact: Frank Thomas, University of Akron, Simmons Hall, 302 E. Buchtel Ave., Akron, Ohio 44325.

Nov. 14-16, Washington, D.C. — **Federal ADP Procurement: 1978 — The Year of Transition,** sponsored by the American Institute of Industrial Engineers (AIIE). Contact Department PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Nov. 14-16, Arlington, Va. — **International Model Building Conference,** sponsored by the Institute for Professional Education (IPE). Contact: IPE, Suite 601, 1901 N. Fort Myer Drive, Arlington, Va. 22209.

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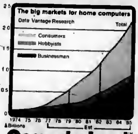

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31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
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Changed to 'Promote Competition'

NBS Official Defends I/O Standard Revision

By Molly Upton
CW Staff

WASHINGTON, D.C. — The revised plan for implementation by the federal government of the proposed channel-level I/O interface standard represents "everything we could do to promote competition," a spokesman for the National Bureau of Standards (NBS) said last week in defense of the plan.

Tom Pyke, chief of the Computer Systems Engineering Division at NBS' Institute for Computer Sciences & Technololgy, refuted charges that the proposed revision is "watered down" [CW, Sept.. 12]. Pyke's group was responsible for the revision, which he said seeks to "maximize all sources at every point."

Under the revised proposal to the Federal Information Processing Standard (Fips), the government can receive bids on a series of boxes from different sources as well as a system from a single vendor if the vendor offers to make at least one channel conform to the standard via an adapter, he said.

The effect on the government will be to increase its choices when buying peripherals, he explained.

The revised proposal allows agencies to install systems that don't have interfaces conforming to the standard. While Pyke claims this feature will promote competition and allow the government to obtain systems at less cost, critics charge the lack of requirements renders the standard unenforceable.

Pyke emphasized that the proposal requires vendors to assure they will make available, at an agreed-upon price, adapters that will conform the channel to the standard's specifications.

Vendors must demonstrate the interface works and conforms to the standard or provide "other means" of proof, such as citation of a previous demonstration on a similar configuration, Pyke said.

Critics have also charged the proposed changes in the federal government's implementation of the standard will make it difficult for procurement officers to evaluate the performance trade-offs of the adapters that might be later added to a system.

In drafting the revision, the engineering division tried to make sure that all can continue to participate in bidding for federal business, Pyke said.

The deadline for comments is Oct. 21. Written comments should be sent to Harry White, Associate Director for ADP Standards, Institute for Computer Sciences & Technology, U.S. Department of Commerce, National Bureau of Standards, Washington, D.C. 20234.

Steel Honored By ACM Award

NEW YORK — Thomas B. Steel Jr., a founder of Share, has been chosen to receive the Association for Computing Machinery's (ACM) Distinguished Service Award.

ACM presents its highest service award annually to an individual "selected on the basis of the value and degree of his services to the computing community."

Steel was cited for his contributions to standards, an area in which he has worked "continuously and productively" since he was a member of the Share 709 standards committee in 1957-59 and a member of the American Standards Association X3.4.2 Language Standards Committee in 1960-61.

Steel was chairman of the U.S. American Standards Institute X3.4 Subcommittee on Common Programming Languages (1965-69) and a member of the ACM Standards Committee (1963-75) and of its Steering Committee (1963-68).

Steel was also chairman of the American National Standards Institute (Ansi) X3 Standards Planning and Requirements Committee (Sparc) (1969-74) and has been the Share representative to Ansi X3 since 1971. He has been chairman of the Ansi/X3/Sparc Data Base Study Group since 1973.

He has been the American Federation of Information Processing Societies (Afips) (and therefore the U.S.) representative to the International Federation of Information Processing (Ifip) TC2 (Programming Languages) Committee since 1963 and the chairman of that group since 1969. He has been the Afips member of the Ifip TC-2 Working Group 2.2 (Formal Languages Description) since 1966 and chairman of that group from 1966-72.

"Tom Steel was one of the founders of Share, the first and still the most prestigious user group," the ACM announcement said. He served Share in many capacities, including membership on its Executive Board (1965-66) and its board of directors (1973-75). He was on the committee that produced the well-known Share study of DP in 1980-85.

In addition to his work on the ACM Standards Committee, Steel was a member of the ACM National Program Committee (1963-66).

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System Helps Farms Avoid Losses From Potato Blight

HARRISBURG, Pa. — Potato farmers are teaming up with Pennsylvania State University's computer to fight potato blight and save the expense of unnecessary spraying.

Using a program written by Dr. Raymond A. Krause, formerly with Penn State, and information received from the farmers on recent weather conditions, the Penn State IBM 370/168 calculates whether spraying with fungicide is needed, according to Joe Peplinski, a senior research aid in the plant disease clinic.

With an average of 100 acres, a farmer can save $800 by avoiding a spraying, he said.

Once a week, a farmer can call in the data collected by a hygrothermograph located in his field. This instrument records on a strip chart the temperature and relative humidity. A terminal operator at Penn State adds this data to the farmer's file and promtly tells him the computer's recommendation on spraying, Peplinski said.

The service costs $100 for the season, and Penn State has about 62 farmers using it, he said. The same program is also being run at the universities of Maine and Michigan.

It made more sense to give the program out to other states because the work was too much for one university to handle, Peplinski observed.

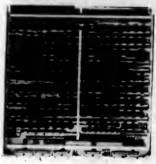
The blight spreads during periods of humid weather and can attack the potato plants during any part of the growing season, he added.

NBS Lectures Now in Print

WASHINGTON, D.C. — The Government Printing Office has published a series of lectures by Dr. Edward Teller and seven other distinguished scientists and engineers on the current and future state of science and technology in America. The lectures, given in 1976, commemorate the 75th anniversary of the Commerce Department's National Bureau of Standards.

Teller's lecture introduces the 166-page publication and is entitled "Science and Technology in America: A Chronicle and Some Predictions." Also contained in the volume is a lecture entitled "Computers in Science and Technology," by Yale University's Alan Perlis.

Copies of the publication cost $2.50 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.



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SEE PAGE 3.

With Mini, TV Camera and CRTs

New York Matching Fingerprints in Two Hours

By Catherine Arnst
CW Staff

ALBANY, N.Y. – A minicomputer, a television camera and three terminals installed here recently constitute a "bona fide state-of-the-art development" in fingerprint classification, according to James Paley, the director of research and development for the New York State Division of Criminal Justice Services (DCJS).

The system, built by Rockwell International and installed in March, enables operators to scan the state's four million fingerprint cards and match those of the same individual in two to three hours, Paley said.

Designed by the DCJS and funded by a grant from the Law Enforcement Assistance Administration, the system consists of a Data General Corp. 820 minicomputer with three CRT terminals custom-built to DCJS specifications and a closed-circuit television camera.

When an arrest is made and fingerprints taken, the fingerprint card, containing prints of all 10 digits is sent by telephone to Albany over a statewide facsimile network. This determines whether the individual has had prior contact with the criminal justice system.

It takes approximately nine minutes to transmit the prints, Paley said.

When an operator receives the prints, he places each digit over the TV camera, which then transmits a picture of the print enlarged by a factor of 8 to the CRT screen.

The operator then identifies the print by pattern type and ridge count and transmits this information to the minicomputer.

The mini assembles the data and transmits it to twin Burroughs Corp. B770 computers, where the state's files are stored. A Burroughs 4000 printer produces a list of all persons in the file whose prints fit those characteristics.

More Accurate

Previously, the division used a manual fingerprint classification technique based on counting the ridges within a specific area of a fingerprint. The use of the television camera and CRT terminals has made the process far more accurate, Paley said.

"It is hard to quantify the difference this has made in our operation" in terms of time and money, he added. "We are doing more with less and the system has increased our internal throughput time, although it hasn't reduced the time involved in the overall operation."

The system is the first of its kind and there has been some interest in it from other agencies, Paley said. All the programs written in Fortran were done by the division and it took Rockwell approximately six months to build the system.

There were no problems in installing the system and it is fully operational, Paley said. There are no plans to expand the system at present; the state is instead trying to work out a way to completely automate its fingerprint files.

CDC Honored For Programs In Mental Health

WASHINGTON, D.C. – Control Data Corp. is one of five companies selected to receive an "Employer of the Year" award from the Mental Health Association and the President's Committee on Employment of the Handicapped.

According to Robert Leys, chairman of the 1977 panel of judges and the association's national vice-president for communications, CDC was selected for its multifaceted employee mental health program.

CDC's 32,000 employees nationwide have access to a free Employee Advisory Resource (EAR) program established to help employees and their dependents. Through this program, employees can work on solutions to personal or work-related programs.

A confidential telephone hotline operates seven days a week, 24 hours a day. EAR received 3,500 contacts for assistance in 1976.

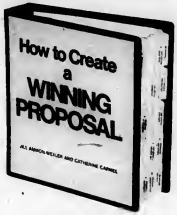
Learning Centers

In addition to corporation-sponsored courses, CDC also gives discounts to employees interested in attending its Creative Learning Centers. Programs are offered on such topics as human potential, assertiveness for women, problem analysis and decision making, crafts and hobbies, fine arts, kitchen arts and courses for young people.

Leys feels that coming back into the world is the most important and difficult step for a person who has suffered emotional or mental illness.

"Stigma and prejudice are the enemies of those struggling to regain productive, self-reliant, healthy lives," he said. "American industry plays a big role in mental health.

"Many employers have made an extra effort to open their doors to those who have experienced mental disorders. This awards programs is an important step in the right direction."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Editorials

FYI

Cresting the Tide

The Waves of Change, a "soon-to-be-published book" that has been serialized in Computer*world* over the past seven months, will be published this fall by Advanced Computer Techniques Corp. (ACT).

The book, whose last chapter will appear here Oct. 17, discusses the economic, social and political forces that drive the computer industry and projects the future based on those forces.

Jammed with statistics and sophisticated analyses, the book can give everyone in the computer community — user and vendor alike — insight into the possible future scenarios for their installation and the industry.

The author, Charles P. Lecht, who is also president of ACT, has done an admirable job of weaving the various computer industry forces into a tapestry of unusual clarity.

Publishing the book in a serial form was somewhat of a departure for *Computerworld* — it was the first time we published long, detailed analyses of the industry. Because the reponse has been excellent, we will continue to offer such articles in the future.

For more information on the book — or to order your own copy — write to ACT at 437 Madison Ave., New York, N.Y. 10022.

Acting on Their Options

Computerworld has received some questions — and arguments — about the survey of large user sites we recently conducted, so an explanation is in order.

The survey — admittedly limited to 20 large IBM sites — was designed to find out what those sites are planning to do over the next year or so in the areas of alternative mainframes, distributed processing and IBM's Systems Network Architecture.

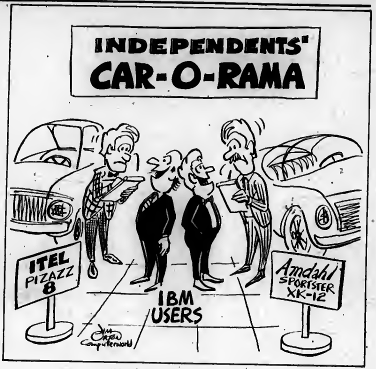
We deliberately did not survey sites that had already switched to alternative mainframes — over the past year we have covered many of those sites in detail. Likewise, we did not include sites which are well known as distributed processing users.

Instead, we concentrated on installations that were solidly within the IBM fold at the beginning of this year, just to see how they view these new developments.

The bulk of the users in existence today are IBM shops and we felt that a quick snapshot of what they are thinking and planning in regard to these new developments would be instructive.

We believe the survey has accomplished that purpose. Most shops we surveyed are evaluating the alternatives available and a surprisingly high percentage are actually switching to one or another of the alternatives.

If nothing else, the survey showed that users are well aware of the choices that will be available to them over the next few years and that they are beginning to act on those options.



'Not for Now . . . Just Looking'

Data Past

Eight Years Ago
Oct. 8, 1969

BEDFORD, Mass. — Viatron Computer Systems announced deliveries of the System 21 would begin Oct. 15. At the same time, Viatron announced two general-purpose computers. The smaller of the two with a 4K 16-bit word memory, the Model 2140, would rent for $99/mo in 1970. The larger, the 2150, with 8K 16-bit word memory, hardware multiply/divide and 24 I/O channels, would rent for $199/mo.

— — —

WALTHAM, Mass. — Honeywell, Inc. introduced a more powerful operating system for the medium-scale H-200 series CPU users. Dual job streams, communications and data transcription could be run simultaneously with the system, dubbed OS/200, permitting greater flexibility and more production for the machines, according to the company.

Five Years Ago
Oct. 4, 1972

PARIS — IBM introduced a data entry system for its European users. The vendor refused to comment on when the system, designed to provide improved data entry for its keypunch users, would be available in the U.S.

— — —

SACRAMENTO, Calif. — Evaluation of a nationwide intelligence network designed to track organized crime figures was underway. The system had been in operation for almost a year and tracked some 3,000 figures believed to be involved in organized crime.

Letters to the Editor

Too Many Taking 'Safe' Route

The article regarding alternatives to IBM CPUs [CW, Sept. 19] is misleading, to say the least.

The list of people surveyed includes many who, for whatever reason, chose not to avail themselves of the Amdahl superior price/performance alternatives, while including only two who have decided to switch.

I find it strange that 62 users who do have an Amdahl 470 weren't surveyed as to why they made the Amdahl choice.

It's not hard to understand why IBM continues to be called a monopoly with users such as you described responding to surveys. If IBM is a monopoly, it's those users who made them one and will continue to keep them with the "safe" approach.

Thank God for Gene Amdahls and DP people with the "guts" to take a chance.

J.J. Huelbig Jr.

Richmond, Va.

Mavericks of the '70s

I am not sure whether this letter should be titled "Shades of the 60's" or "Here We Go Again," but your recent articles on OEM CPUs prompt me to write.

Remember when the DP manager who installed OEM peripherals was considered a maverick? Remember when we heard from one computer operations manager after another saying, "It's all right for the other guy to use OEM peripherals, but my shop is different; I couldn't possibly use anything but IBM gear"?

Remember it all? Well, wake up, because the same thing is happening in the '70s, only this time it's CPUs.

Our job is to manage change, and the successful DP manager will not mistake inaction for conservatism. If alternatives are not studied openly and objectively, then the results are likely to be second rate.

From experience I can say that an OEM shop may not be the easiest to run, but then who said our job was going to be easy in the first place? Remember, it is the bottom line results against which we are all measured, whether we like it or not, and those that don't measure up will fall by the wayside to make room for those that do.

We are entering into a whole new era of data processing. The good managers will survive and prosper, as they should.

Michael S. George

Bridgeport, Conn.

Meaningful 'Hit Ratio'

If the "hit ratio" for the National Crime Information Center (NCIC) [CW, Sept. 12] means hits per number of inquiries, one would expect it to be low. If, however, hits are divided by the number of inquiries which *should* find a hit, then a low figure would be most alarming. It seems to me the first definition is worthless and the second, although difficult to determine, is meaningful.

The whole question is analogous to measuring picking efficiency in a warehouse. You throw out nonstock parts before you divide the number of attempts by the number of complete picks. In the case of the warehouse, you know that you don't expect to find the parts, so you don't count them in the total number of attempts.

R. Sides

Myrtle Beach, S.C.

(Other letters on Page 22.)

Must Analysts Be 'Renaissance' People?

The Human Connection

By Jack Stone
Special to CW

Most users pin their hopes for success of a DP systems project on the skills, knowledge, communications capabilities and intelligence of the systems analyst. I often wonder just how many of these wishful thinkers know or appreciate how tough it is for the analyst to do his job - if for no other reason than there are so many tasks to get done in a typical project.

Paul Oyer, a long-term researcher of the analyst function and now with the U.S. Treasury, complained to me that DP management has generally burdened the journeyman analyst with more than 300 identifiable tasks which must be accomplished to succeed at the systems job.

He has loosely gathered these tasks around the following group headings: analyst, synthesist, salesmen, politician, listener, programmer, operator, designer, engineer, architect, writer, evaluator, futurist, model-builder, planner, theoretician, pragmatist, innovator, organizer, team leader/player, troubleshooter (sometimes "schemer"?), manager, statistician and decision-maker (or real chief executive?).

It is incumbent on the DP manager to establish proper guidelines with the local personnel department to ensure that recruitment policies mirror the current personnel needs of the DP organization. We surely can be thankful that the outpourings of Oyer's research and those of other students of the art of systems analysis will take forever and a day to ooze out into the field. Otherwise, the jobhopping analyst might be subjected to a recruitment interview that could go something like this:

Setting: The office of Clayton Buckingham, Director of Recruitment for Heptronics Corp. The company has a large-scale DP system installed for both engineering and administrative work. DP support for the engineering staff is in fine shape — it handles its own systems work. But a frantic search is on for analysts to help get the new payroll system on the air (it's now five years behind schedule).

Enter Morris Meadowbrook, an experienced analyst who built his nine-year career on the well-established growth ladder: college, programmer, junior analyst. He saw the full-page ads from Heptronics in the trade publications, decided that he, too, wanted to get involved and walked in off the street.

"Come right in, Mr. Meadowbrook, come right in here! Please sit down and let's get right to it! We here in Heptronics personnel have a right good idea of what our computer folks want to see in their new people. So let's start with a few questions about your background. Would you first tell me what selling experience you have had? I mean, precisely what type of sales territory did you have with IBM?"

"Well, now, I am a professional systems analyst, and people of my ilk never have computer sales experience. It really isn't the image that we are trying to project for our profession. I did, however, sell encyclopadias door-to-door during my high school summers, an experience which well prepared me for dealing with my current users."

"Encycloooo, — yes, uh, oh, well, let's move on to the next one. Can you describe some of the models you have built in recent years?"

"By all means! At college, while others wasted their time on social activities, I concentrated on extending my intellectual powers. I took up the hobby of building large mechanical structures out of toothpicks and glue. My crowning achievement was an exact replica of the Eiffel Tower, 44 inches high, although I must admit that it tended to lean in the summers when the glue softened."

"Let me ask the question in a different way: Did you carry out any simulation projects?"

"Oh, I see what you are getting at! I broadened my experinece in this dimension by taking a special course in mime just a few years ago. By the way, this background gave me the basis for developing my new theory of "Structured Independence," a compilation of original methodologies for ensuring that the rugged individualism of the DP analyst shall never perish from this earth."

"Perhaps, Morris, I should try another tack. Tell me about your successes as a team leader."

"As an avocation, I organized a primal therapy group in which I have had the honor of being the lead screamer for more than two years. Gosh, this experience has just been invaluable in relaxing me from the workaday travail."

"How about this one? Any troubleshooting jobs?"

"Got it! I was a naval electronics technician aboard a carrier during the Vietnam war."

"Good to hear, sooo good to hear! Tell me more!"

"Well, really there wasn't all that much to it. When some hardware system failed, I just replaced boxes until the system started up. Our captain had a penchant for neatness so I just 'deep-sixed' questionable units. In fact, now being an analyst in a microcode project for a microcomputer firm, I proposed Meadowbrook's Motto as the team slogan, based on my naval experience; "When in doubt, throw it out!"

"Morris, I've got to hand it to you! Although your experience is orthogonal to our needs in certain respects, you ring the bell for resourcefulness! You're hired!"

Too Many Ethics Questions Unanswered

The Taylor Report

By
Alan
Taylor
CDP

Frank Vaughan and Frank Cary have probably never met each other, but both are members of the computer community and recently both have shown they feel the need for computer ethics of some sort. Frank Vaughan is a *Computerworld* reporter, currently writing about both the large systems and the home computer area, which keeps him moving around. Problems arose for this Frank when the modern, up-to-date system of getting his money into his bank account started breaking down — not just once or twice, but regularly! CW pays Frank through the First National Bank of Boston, which forwards the funds to whatever bank he designates — in this case the Shawmut Community Bank in Newton. Since Frank is often away on payday, this is essential for smooth living.

Payment is made every two weeks, with the funds leaving CW's account in time for a Friday payment into Frank's account. It's a computerized system for everyone's convenience, but it has problems. Even though the First National takes the funds on time, Frank often doesn't receive his money until days later, sometimes not before the following Wednesday.

Repeated Overdrafts

Frank uses an interest-bearing NOW account but often runs the account down, so checks presented after the cash is supposed to be there just aren't covered. And sometimes, they have been returned for "insufficient funds."

At the base of the systems problem appears to be that NOW account, which uses a different magnetic-ink character recognition (Micr) coding than was allowed for in some parts of the system — exactly where, I don't know. NOW accounts are new — even in Massachusetts where they started — and the systems were apparently not updated to handle them reliably.

The problem that concerns Frank is the ethics of the bank's failure to notify him when the system breaks down and the funds are not transmitted properly and on time.

And to whom should he turn to find out whether that is a proper ehtical standard? This is an important question.

Frank No. 2

The other Frank is Frank T. Cary, top corporate officer of a computer firm. His position, like that of Frank Vaughan, brings him into direct contact with other people's computerized systems. A question came to his attention about the ethics of a client's use of some computer systems and whether that application "abridged human rights."

In the case in question, this Frank's company was able to answer the question to its own satisfaction.

However, I don't know what standards were applied or where to find out if any such standards even exist. This also is an important issue: Computer users really need to know where to go to get the latest information about such matters.

For instance, reading the September issue of the Braniff airline magazine last week, I found myself with a question about computer uses that inconvenience people. The article was about a computerized cash management system, which was based upon electronic transfers into a central account from local banks around the country. Funds were often available for use the same day deposits were made. So far, so good.

But then the article went on to discuss, with approval, the practice of paying Chicago accounts out of New York banks so as to continue to get the use of funds during the collection process. It also commented that "remote payment" was an essential part of any cash management system.

I started thinking about this. Clearly, it was a task suitable for computerization and well within the economic limits of today's firms.

But essentially, the application was inconveniencing some other, outside people to their financial detriment. In fact, a few steps along the way and I can see a computerized routine for kiting checks coming out of these systems and being routinely used to cover the situation automatically whenever there is a shortage of funds.

Who would tell me whether that was considered ethical if I were asked to write the routine? Currently the answer is no one. And that is where the problem lies. Someone in this profession should do so. But who?

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Correction

An added zero caused confusion in a discussion of possible realistic ceilings for damages under the Australian Trade Practices Act [Taylor Report, Sept. 19]. Going up in orders of magnitude from a $100,000 base line, the comment should have indicated that as legal costs potentially involved in fighting a computer law case could exceed either $100,000 or $1 million, then neither of these possible ceilings would protect the victim from further victimization even if he won his case.

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Letters to the Editor

To Improve, Not to Condemn

Jean A. Fowler's letter [CW, Sept. 19] on my search for operations success stories ["The Human Connection," CW, Aug. 22] deserves some comments.

Fowler's findings that my "theorem" on needs for DP human successes is "poorly developed and unsubstantiated" perhaps evolves from my choice of style and structure for the column. Exercising literary license, I purposefully gloss over dreary discussions of facts and figures, both to enshroud my engineering background and to simulate the communications of a typical human being. That I don't write about the basis for my postulation doesn't mean it does not exist.

My idea of advertising for the "successful" center was born out of my long-endured frustration derived from listening to so many unresolved DP "people problems" for so many years. Also I had just reviewed my public discussions on the matter, which included many of my 50 CW columns (millions of exposures) and a dozen or so lectures and papers (thousands of exposures) during the last 18 months. Most distressing was my difficulty in finding anyone to disagree with my conclusion that human relations in the computer center are an unmitigated disaster.

Feeling that human communications effectiveness — and all it implies — is the heartwood of DP systems successes, I originally concocted my "theorem" and "search" as a journalistic ploy, endowed with the delicacy and subtlety of a sledgehammer to drive the point home to the readers once and for all.

Now, I believe that I'm on to a great story and I intend to follow it through, not only because it's good journalism but because, contrary to Fowler's assessment that I am "condemning them all," I love this crazy industry and hope that this story, in some small way, may make it better.

Jack Stone
Washington, D.C.

Two Do-It-Yourselfers

While it is interesting to note that Ray Carlson fills his own water pitcher ["Withington Still on Stand, IBM Trial Plods On," CW, Aug. 22], we should keep in mind that Marshall McLuhan answers his own phone.

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SEE PAGE 3.

Better Stick to Your Desk

DP Education Worthless in Everyday Use

By Frank K. Binder
Speciai to CW

Microhours efter IBM admitted to bombing out with its 600 series end announced the 1401, I enrolled in one of the very first courses at e local knowledge dispensery to learn how to clear storege by way of a slash in the op code.

Why? I still wonder — unless, like a front-runner lemming when reaching the cliff, I wanted to be one of the first ones over.

The course finished before the 1401 saw the dencing neutrons of the fluorescent overheed bulb. We ended up with our lab fee refunded after e course as intellectuelly stimuleting and es valuable as Wagner's "Ring Cycle" played on a Berkshire dulcimer made out of sheet rock.

One of our more intelligent colleagues did the only sensible thing. He slept through the whole course, save for 10 minutes at the beginning of each cless. He was from Alebame and linguistically frugal.

When esked his opinion of the instructor, he seid simply: "Weahl, yuh cen put a sailuh suit on a muskret, but that doan make him e admirel."

Typical Case

As usual, it was a case of a nonpellucid instructor armed with menuals written by English mejors with a minuscule smathering of ignorance about the technical entreils of the subject on hend. Thus, when debeting education in America, one could devote a good many chepters to the "modus vivendi" et our centers of acedeme, besides the psychologicel, sociological and other assorted nonscientific and useless gitch in theoreticel nonsense, that is indeed what is taught best.

The curse of e classicel education received in Europe seldom encourages me to draw comperisons between the effectiveness of the seats of leerning in Europe end America.

Any intellectuel intercourse on the matter is doomed to e duumvirate of perdition. It either degeneretes into e shouting match or, like milking a jellyfish, soon proves fruitless. It is sheer torture to listen to debaters who can't hang two sentences together without seven "you knows." And one must suppose thet a Ph.D. in enthropology or paleantology specializing in Byzentine plinths will do that to you.

Twenty-five dollars buys you the right to wear your collar beckwards, end surely we ell know of a post office box somewhere willing to spit a college diplome at you for a slightly higher price.

Somedey soon we'll have to apply the pyramid principle: The broader the bese, the higher you can build." Give the bugger e sound base end he is teechable. Teach him to be a specielist and he spells "wrepped" es "raped" end barely distinguishes a light bulb from a plover's egg.

A valued friend of mine whose credentiels literally stretch from Hervard to the moon by way of MIT sent me en interesting postcard sometime ago from Celifornie. Before he became part of the teem et MIT responsible for the programs of the guidance systems for the Apollo moon shot, he tried UCLA for his mester's. Two months after his enrollment ceme the postcard, which read in pert, "UCLA is California's answer to Rindge Tech."

Reader Commentary

Out of this jumbled milieu emerges today's semiliterate twit, an instant hit in the unemployment line. Surely someone will now point to our monumental technological achievements in space. Perdon my mirth-heaving shoulders, but when Explorer I caught Sputnik in the big void, the Russian looked around carefully, then sidled over to our own end whispered, "Jetzt koennen wier Deutsch sprechen."

That our industry is making such enormous strides is due entirely to

(Continued on Page 24)

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DP Courses Boring, Have Little Usefulness

Reader Commentary

(Continued from Poge 23)

the determination of a free spirit, the likes of which, in all my travels in strange lands, I have witnessed only in America. What e pity it all becomes a reality only outside the classroom.

Some highly regerded Soviet academicians, when first told of data processing, simply dismissed it as "capitalist witchcraft." Here, however, as soon as the permanence of our industry exploded in the skulls of the doddering dons in the ivory campus tower, the colleges dove in.

Judging from the resulting calibrated output, the quintessential lads of our industry are not the ones from these institutions. Often it's a hopeless case of "ex stercore aurem."

Meanwhile, the fringes of our industry are becoming overpopulated with a far worse scourge, the buzzword hyenas. They have creeted a whole new industry end are very successful at it and as quelified as a legless track coach.

Lives there e DP manager who doesn't daily get bomberded with volumes of unguided missiles propelled by his own flatulence, assuring him of his total impotence at his post? Every author of every pemphlet threatens to drag him kicking and screaming out of his mesozoic stupor end into the computer century.

Unless you read ell publicetions. compiled by these "experts" from cover to cover,. you shall forever remain condemned to Pluto's Regnum without ever glimpsing Euridice.

Recently one of the many departments of something or other in Washington offered me a subscription to something I can't afford to miss. I really don't mind my government using my tax dollars to tell me I am an imbecile, but I draw the line et having to pey for it twice. The publication, you see, is not free.

Then there are also the seminars and special courses, without which we are supposed to be able to function in our chosen professions. Now, if somehow with the help of some miracle drug we managed to opt out of sleeping, we could read about one-tenth of all the literature projected onto our desk daily and simply keel over with either self-inflicted dyslexia or ventricular fibrillation without learning anything.

All DP professionels must daily swim against a torrential effluvium of fright tripe, spewed at us by all these self-made deii ex machinae, hell-bent on gold-lining their mattresses. Each seminar is a must, each unique, most only three deys, for only $490 — room and board and transportation extra, of course.

Attend only three of such structured chaos sessions and you start wondering if perhaps the law of diminishing returns has finally invaded your cranial CPU. After all, how would you, without attending at leest 17 of the seminars in two months, know that what you were presumptuously calling a master file has by the pervert geniuses been designeted a data base?

And how horribly gauche of you not to call an ADD FILE a data bank. Why, if the Martians landed in your installation, they would surely wring their hends and your neck, clessifying you as a member of a subspecies of a subcivilization.

So, like Xanthippe, fling the bowls of blancmange back into the faces of the would-be Socretes with a resolute "Thank you." Keep tending to your metier es you did for the past 15 years end your reports will keep coming out on time and accurately, while the self-ordained educational cretins go ebout inventing the wheel by another name.

Binder is director of DP at Air New England in Boston.

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'If at First You Don't Succeed . . .'

Rethinking Failures Could Lead to Success

The Sociology of Computing

By Miles Benson
Spacial to CW

How do you taka a computing projact that failad and convert it into a haadlinamaking business success?

Rethink your marketing strategy.

At least, that was the answer Joe Bill Jackson found.

You may remamber the story of In-Touch. Joe Bill sold Ring-a-Ding Tel and Tel on the idea of computer power in the home. The Touch-Tona phone was tha vahicle for his call-up servica.

Even Ring-a-Ding President Ma Bile came to the opening of a pilot version of the servica in Scanic, Kansas.

But the customers stayed away in droves. And when Joe Bill finally unplugged In-Touch and left Scenic, it was an economic failure.

Philosophers say failura is the most severe tast of a person's inner strengths. Well, Joe Bill was tested mightily. When his draam died, a little of the dreamer died with it.

After a mourning period, however, Joe Bill started to struggle back.

"What really went wrong?" was the question that kept reverberating through Joe Bill's brain.

As the months ticked by in Joe Bill's psychological exile, he struggled to grasp the shape and substance of the failure. He had decided to remold In-Touch and try again, but he had to understand the reasons for failura to avoid them next time.

His first major problem, Joe Bill realized, was to quit thinking as a technologist. He had a product to market to the public. The public doesn't buy technology, he now knew, the public buys servica.

A small glimmer of light formed at the end of his mental tunnel. He grabbad a plane, flew back to Scenic and sifted through tha archived data on In-Touch usage.

The income tax calculator service had baan a solid but not outstanding performer. The desk calculator function had baan a total loser — the cheapie hand-held calculator wiped him out there. Data storaga had baen littla used.

But tha automatad bill-paying sarvica? The bill-paying service had been a roaring success.

Joa Bill narrowed his thinking to the bill-paying problem. It appeared the secret to succass was attracting marchants. But how could he do that? And if he was not up to that task, who could best do it for him?

Banks. Tha obvious answer was banks. And suddanly Joe Bill was offering a sarvice which was not a technology toy — it was a bill-paying servica.

No, it wasn't a bill-paying sarvice. It was electronic funds transfer.

The implications were staggering — Joa Bill had been sitting at the forafront of an explosiva naw technology and hadn't even known he was there!

But now he knew. Visions of a new company sprang into his mind: EFT, Inc. Joe Bill began to raalize his future no longer was weddad to the phona company. He could go it alona.

And that brought him right back to banks. Joa Bill made a whirlwind tour of major banks across the land. "Buy into EFT" was his message.

Well, it worked. Joe Bill lined up a consortium of a half-dozen banks from Audible Chasm, Nev., to Open Spaces, Mass., to back him. And anothar dozen accounts were raady to put up enough money to offer the sarvice.

The moral of tha story? It's too traditional, too predictabla to even say. But it starts out with "If at first you don't succeed . . . ."

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Ecoma Comin'

HAMBURG, Germany — A series of seminars by Dr. Gary Carlson of Brigham Young University and a technical session on Amdahl Corp. measurement technology will be among the highlights of the European Computer Measurement Association (Ecoma) conference here later this month.

The meeting is open to all interested people, the program chairman noted.

User workshops covering various types of software measurement methods, hardware monitor demonstrations and vendor presentations will also be part of the "Ecoma-4" program, which will run Oct.25-27 at the Hamburg Plaza Conference Center, according to Ecoma president Scott N. Yasler, who can be reached at the Union Bank of Switzerland, CH8021 Zurich, Switzerland.

'MAS-80' Built to Use DBMS, Runs on Mainframes or Minis

By Don Leavitt
CW Staff

BALTIMORE — Martin Marietta Data Systems, Inc. (MMDS) has introduced a rewritten, updated version of its Modular Applications System (MAS) software. MAS-80 will serve its users throughout the 1980s, MMDS said.

Like the original software, MAS-80 was designed as a modular set of systems that includes all the functions necessary for the integrated operation of a manufacturing company — inventory control, production control, engineering control, distribution/order entry, financial control and business planning.

Those six major functions are made up of 20 individually purchasable elements. Despite their "individuality," however, the elements are so fully integrated that some are prerequisites of others.

An inventory control system, for example, can range from $50,000 to $120,000 depending on the elements selected, a spokesman noted.

'New Generation'

MMDS described MAS-80 as the start of a "new generation" of software. From the beginning, the system was built around the use of a generalized data base management system (DBMS) so it could accommodate any DBMS the user chooses.

There are separate access modules for each DBMS but the linkages are so transparent to the user, according to the vendor, that MMDS was able to test its application programs in an IBM IMS environment and then run acceptance tests a "very few days later" at the first user site, which utilized Software AG's Adabas.

Family Design

"Family" is another word the vendor used in describing the design goals of MAS-80. MMDS ultimately expects to have the same logical elements available on mainframes and on minicomputers in on-line and batch processing operations.

All the modules, including the DBMS accesses, are to be written in ANS Cobol to simplify the portability, MMDS said.

First Release

Upwardly-compatible with the original MAS, MAS-II is the first MAS-80 release. It is a transaction-driven system for use under IBM OS and VS or compatible operating systems.

The system accepts transactions from local or remote terminals and updates the data base as the transactions are entered. Reports under MAS program control are generated in batch runs at night, but inquiry capabilities supported directly through the DBMS could be used to get more immediate feedback, the spokesman acknowledged.

More information about MAS-80 is available from MMDS, 300 E. Joppa Road, Baltimore, Md. 21204.

Atsu-Backed Study Shows

Financial Planners Using Networks

STAMFORD, Conn. — Fifty-eight percent of top management has a positive attitude toward the use of computerized financial planning systems, according to a survey of large corporations.

In a report published by Real Decisions Corp. (RDC), 100 users of such systems were interviewed to determine the extent and use of such automated tools. Companies represented in the survey were Fortune 1,000-sized firms plus subsidiaries and divisions of other large corporations.

Users reported activity with more than 20 different financial reporting and modeling systems currently marketed by remote computing networks. General Electric and the Service Bureau Co. were the vendors most often used by this survey group.

In addition to extensive use of remote vendors, many firms reported increasing interest in buying and installing financial systems packages on in-house equipment; in fact, RDC noted, 84% of the respondents have access to an in-house computer.

The user survey, prepared in conjunction with the Association of Time-Sharing Users (Atsu) comprises one part of a 273-page report published by RDC. Additional sections of the report present information on the financial planning packages available from 18 remote vendors.

The results of the user survey determined the selection of these vendors as well as the product features and capabilities analysis, an RDC spokesman said.

RDC, in conjunction with Atsu and other expert users, designed a set of typical financial problems which were used to develop comparative cost data for each package.

Abstracts of the report are free to Atsu members and available to others for $85 from RDC, 870 High Ridge Road, Stamford, Conn. 06905.

'Jobstream' Verifies System Changes

ATLANTA — The TDS Synthetic Jobstream from Trusco Data Systems (TDS) allows technical support and operations personnel to verify operating system and hardware changes without sacrificing production schedules, according to a spokesman.

For the technical support staff, the package can check such things as new system generations, the application of temporary fixes to the operating system and the dimensions of a problem.

System assurance tests and checkout of new or modified access methods are also handled by the software, the spokesman said.

The operations staff can use the Jobstream to verify hardware changes or to run acceptance tests of new equipment.

Since the package does not require a dedicated system, it can be used frequently to maintain high availability, reducing reruns and meeting production schedules, the spokesman noted.

Jobstream runs in one region on any OS/VS1, SVS, MVS or equivalent environment on IBM or IBM-compatible hardware. It generates its own test data and has no prerequisites in terms of IBM program products, TDS said.

TDS Synthetic Jobstream costs $800, which includes BAL source code, one printed copy of pertinent documentation (the source code tape also contains a data set that has all the documentation on it) and installation data. TDS can be reached through P.O. Drawer 4418, Atlanta, Ga. 30302.

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'OSI/Law' Eases Trial Paperwork

SANTA CLARA, Calif. — Optimum Systems, Inc. (OSI) has reportedly taken the best features of four separate remote computing services it had for attorneys and has integrated them in a single litigation support system called OSI/Law.

The system is said to be both flexible and easy to use, having been designed specifically to assist attorneys in the management of evidentiary documents, pleadings and testimony involved in a litigation.

OSI/Law provides comprehensive indexing, search, retrieval and report capabilities of material pertinent to a case —, as selected by the user/-lawyer — which is stored in abstracted form on OSI's IBM 370s but accessed from terminals in the lawyer/user's office. Literally hundreds of thousands of documents applicable may be cataloged and searched through OSI/Law, a spokesman claimed.

OSI utilizes the Telenet communication lines to move work between the user and the company's data centers, so access to OSI/Law is available over local dial-up lines in any of the 52 cities served by Telenet, he added.

OSI is headquartered at 2801 Northwestern Pkwy., Santa Clara, Calif. 95051.

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MSA Puts FICS On DEC Systems

ATLANTA — The Financial Information and Control System (FICS) from Management Science America, Inc. (MSA) has been adapted by the software house to run on Digital Equipment Corp. Decsystem-10s and -20s. FICS is already available for Burroughs, Honeywell Information Systems, IBM and NCR CPUs. The DEC version costs $40,000 to $50,00 from 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

QED Adds DBMS Book

WELLESLEY, Mass. — Written by Dr. Peter Chen of the MIT Sloan School of Management, a monograph entitled "Entity-Relationship Approach to Logical Design" presents an approach to data base design making data organization easier to understand and accomplish, according to the publisher, QED Information Sciences, Inc.

The "entity-relationship" approach is not restricted to the capabilities of a data base management system and is independent of storage and efficiency considerations. This means there is greater flexibility and the resulting schema is more easily understood by non-DP people, a spokesman explained.

Part of a continuing series of data base monographs, the Chen softcovered book can be purchased for $15 ($12.50 prepaid) from QED, 141 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

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	San Francisco	Los Angeles	Cleveland	Minn/St. Paul	Chicago	New York	Philadelphia	Washington D.C.	Boston	Total
Corporate Officers	784	962	442	284	849	1,172	458	333	871	5,955
Systems Mgrs & Operation Mgrs	1,619	1,665	1,115	944	1,995	2,403	1,131	1,009	1,182	13,063
Programmers & Analysts	998	1,138	662	688	1,381	1,338	729	532	712	8,178
Engineering Mgt & Engineers	709	847	380	309	727	662	307	255	841	4,837
Sales & Marketing Personnel	353	371	241	215	385	592	204	187	410	2,958
Consultants/Accountants	299	293	133	115	381	578	190	151	381	2,519
Librarians/Educators/Students	209	311	192	157	207	264	127	98	121	1,686
Others	370	411	279	265	471	445	249	225	287	2,982
Total	5,341	5,998	3,444	2,977	6,396	7,452	3,395	2,790	4,385	42,179

Attendance by Industry Classification

	San Francisco	Los Angeles	Cleveland	Minn/St. Paul	Chicago	New York	Philadelphia	Washington D.C.	Boston	Total
Computer Manufacturing or DP Hardware/Peripherals	978	1,132	488	536	658	902	249	143	823	5,905
Manufacturer (Other)	551	912	789	548	1,480	1,039	848	130	736	8,833
Serv Bur/Sftwr/Plnng/Consult	710	978	390	255	745	1,049	506	375	558	5,566
Pub Util/Comm Sys/Trans	355	244	248	217	418	599	240	137	199	2,857
Wholesale/Retail Trade	310	288	191	227	410	472	154	99	253	2,404
Finance/Insurance/Real Estate	594	578	336	266	813	1,055	482	384	344	4,850
Mining/Const/Petroleum/Ref	105	104	68	28	119	87	59	30	119	717
Business Service (Except DP)	143	141	78	57	218	271	104	47	166	1,223
Education/Medicine/Law	478	568	305	340	595	803	379	260	405	4,133
Government-Fed/State/Local	693	541	282	206	384	288	280	902	275	3,831
Prntg/Publish/Other Comm Serv	101	139	87	115	187	340	120	97	184	1,350
Others	325	375	224	184	371	547	174	186	323	2,709
Total	5,341	5,998	3,444	2,977	6,396	7,452	3,399	2,790	4,385	42,178

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Data Flow Diagrams Ease Planning of Any Systems

By Chris Gane
And Trish Sarson
Special to CW

New techniques and tools for systems analysis have been developed recently which simplify and improve the analysis phase of systems development by improving communications between computer people and nontechnical users, producing better functional specifications that save design time and by helping to make sure the right system gets built.

The underlying concept of structured analysis is the building of a logical (nonphysical) model of the current or proposed system using graphical techniques which enable the analyst and the users to "see the wood for the trees." The analyst can give the users a vivid picture of how the various parts of the system fit together to meet his requirements, and the user can give meaningful input based on the model.

Once this logical model of the system has been accepted and specified in appropriate detail by the analyst, it can be used to communicate the functional specifications to the system designer, with the advantage that the model specifies *what* the logical requirements for the system are while leaving the designer as free as possible to decide *how* they can best be physically implemented.

Building the Model

How can such a model be built?

Consider an organization whose business is selling books by mail order. People call or write and order a book; there has to be a check to see if the book ordered is available. Unless the payment for the book is sent with the order, there also has to be a check of the customer's credit.

We can show this in a logical data flow diagram (DFD) as in Figure 1. In this DFD we have used four symbols: a shaded square for sources/destinations of data; an arrow for flow; a rounded rectangle for processes that transform flows; and an open-ended rectangle for data storage.

These symbols and the concepts they stand for are at the *logical* level: a flow of data can be physically contained in a letter, an invoice, a telephone call, program-to-program linkage, via a satellite data link, anywhere data passes from one entity or process to another.

A process can physically be a roomful of clerks calculating discounts, a JCL-cataloged procedure, a program or a combination of manual and automated activities. A data store can be a rotary card file, microfiche, a filing cabinet, a table in core, a file on tape or disk or an IMS data base.

Using the four symbols enables us to draw a picture of the system without yet committing ourselves to how it will be implemented.

Of course, the system picture in Figure 1 is pretty general; in fact, it is at so high a level of abstraction that it is rather useless. Nonetheless, we can construct a picture of the system at any level of detail we choose, using only these four basic symbols.

Let us expand "Process Orders" to show the logical functions that make up the present system. For starters, we can note that the incoming orders must be checked to make sure that the details are correctly stated (that the title and author match, for example).

Further, once we have a valid order, we need to batch it together with orders for other books from the same publisher so we can get the benefit of quantity discounts.

Figure 2 shows what the data flow looks like now. We see from this DFD that, as each order is checked, it is put in some store of pending orders until (according to some logic we don't need to specify yet) a batch of orders can be assembled into a bulk order.

Filling the Orders

So far, so good. But what about filling the orders and, hopefully, getting paid for them? Each publisher will send a shipping notice with each shipment, detailing its contents; this must be compared with the order placed to make sure the right numbers of the right titles were sent to us.

Where do we find the details of the orders we placed? Clearly there must be another data store, perhaps called "Publisher Orders," that can be interrogated. Once we have the right books available, we can assemble and ship orders to each individual customer.

Figure 3 shows the system with these features added. Even at this point, no one is getting paid for anything. We need to send out invoices to our customers and handle the payments they send us.

There being no free lunch, we will in turn be billed by the publishers who supply us and will have to make payments to them.

Figure 4 shows the addition of these financial functions with their associated data stores, commonly known as accounts receivable and accounts payable.

It should be clear that Figure 4 is a general data flow diagram for any enterprise which takes in retail orders, purchases in bulk and breaks bulk, without holding inventory.

The diagram is easy for users to understand, since it does not have any of the flowchart symbols which are "visual jargon" and the terms used are in the user's language. At the same time, the logical data flow diagram serves as a precise statement of what the functions of the system are and how they are related.

Gane and Sarson are principals of Improved Systems Technologies, a New York consulting firm, and author/publishers of Structured Systems Analysis: Tools and Techniques, *from which this article was extracted.*

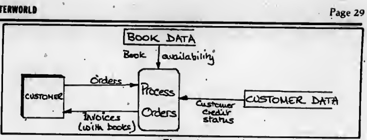

Figure 1

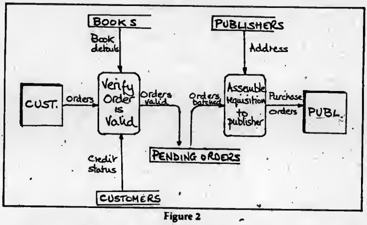

Figure 2

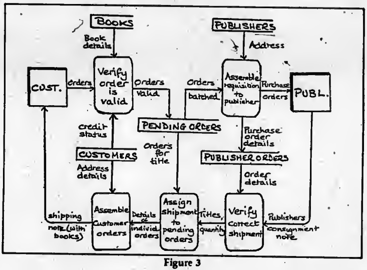

Figure 3

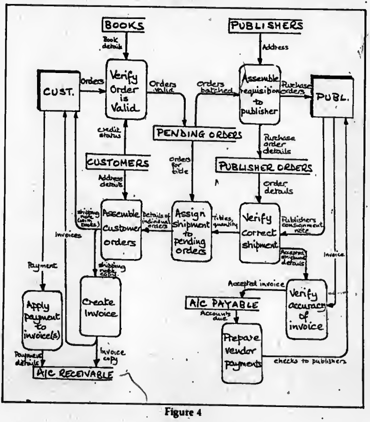

Figure 4

Publication Devoted To Documentation

CHICAGO — Sandra Paking & Associates, a group of specialists in writing for the computer community, has released the first issue of a planned management-level quarterly newsletter called "Folio."

It will be devoted to topics on or related to documentation of computer application systems.

Subscriptions to the newsletter are $25/year and can be made to "Folio," Sandra Paking & Associates, Inc., 6007 N. Sheridan St., Chicago, Ill. 60660.

3270s Get TSO Support

KINGSVILLE, Texas — A software package that reportedly allows IBM 3270 terminals to operate in full formatted mode while under the Time Sharing Option (TSO) on IBM 360/370 gear, as well as a separate-cost interface to support use of Cobol in that environment, are now available from South Texas Time Sharing, Inc. (STTS).

The TSO enhancement package itself supports use of PL/I(F), PL/I Optimizer, PL/I Checkout and Assembly language programs, a spokesman noted.

Users specify CRT display attributes in high-level terms and the STTS software produces all the text strings required to communicate with the terminal through TSO and Tcam or Vtam, he added.

Features of 3270 that are supported include protected and unprotected fields of "any reasonable length," numeric and alphabetic fields, all three light intensities, the audible alarm and the selector light pen, the spokesman said.

The basic TSO enhancement package recognizes 21 commands and will run under TSO on current releases of the MVT, SVS and MVS implementations of IBM's operating system. The package costs $4,400 while the Cobol interface (which requires the basic package) costs an additional $330.

STTS can be reached through Box 2001, Station 1, Kingsville, Texas 78363.

'Space Billing' Facility Extends SMM 'DMS/OS'

SACRAMENTO, Calif. — Available now as a separately priced optional extension of the DASD Management System (DMS/OS) from Software Module Marketing (SMM), the DASD Space Billing facility gathers accounting data through scanning of the volume tables of contents (Vtoc) at user-selected intervals.

The scanning can be based on either track or "kilobyte days," the latter unit of measure being preferable if a multiplicity of device types is involved, according to an SMM spokeswoman.

From the scans, the module generates a detail listing of data sets that can be sequenced by data set names or by user-supplied account numbers. It also prints summaries by volume serial number and device type and creates a detail record which can be processed by the installation's accounting system, SMM said.

Uses Tables

Tables are utilized for the association of volumes or volume classes with billing categories and billing categories with rates per allocation unit. The volume class is designated by a volume serial prefix of less than six characters, allowing one entry to designate all volumes possessing the common prefix, the spokeswoman said.

It is not necessary to supply DD cards for each volume to be scanned. The serial numbers of all on-line volumes are passed against the list of volume and prefixes provided as a parameter in the command which initiates the Vtoc scanning, she added.

Track Comparisons

Among the items included in the reports is a comparison of tracks allocated vs. tracks utilized.

The basic DMS/OS is available for $10,000; the DASD Space Billing "selectable unit" costs an additional $1,500, SMM said from the Crocker Bank Building Penthouse, 1007 Seventh St., Sacramento, Calif. 95814.

'Alphatran' Aids Fortran Coding

CUPERTINO, Calif. — The Alphatran package from Alpha Analysis "translates" an extended version of Fortran into standard source code for that language to simplify the precompiler stages of program development and produce code that is "more readable, testable and reliable," according to a spokesman.

With the package in place, the user can work with nestable control block structures such as WHEN ...THEN ... ELSE. In addition, a generalized DO loop permits backward-running, negative, real and double-precision control variables, he claimed.

'Control Words'

Beyond that, "control words" that permit more efficient and understandable code than is possible under "standard" block structures are also part of Alphatran, he said.

"Internal procedures" supporting names with up to 63 characters are among the other features. These permit and encourage the development of self-documenting code by top-down, structured techniques, the spokesman said.

Free Format

Alphatran allows programmers to prepare source statements in free format. As part of its output, the package produces an indented source statement listing, he added.

The software can be used on any mainframe that supports Fortran and has been designed so it can be used on many minicomputers as well. It costs $795 and can be ordered from Alpha through P.O. Box 1572, Cupertino, Calif. 95014.

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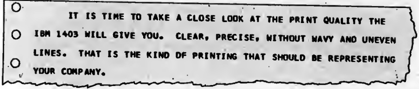

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CW at TCA

Many Products Feature Micros

Adapters for IBM 3600 Among Debuts

By Ronald A. Frank
CW Staff

SAN DIEGO — A variety of telecommunications products, many of them microprocessor-enhanced, were shown at the annual conference of the Tele-Communications Association (TCA) here recently.

Racal/Milgo (formerly International Communications Corp.) of Miami and Intertel, Inc. of Burlington, Mass., exhibited adapters that will allow users of the IBM 3600 series terminals to utilize standard modems.

The terminals use an interface with Synchronous Data Link Control (SDLC) loop configurations that include a phone jack. The adapters convert the phone jack interface to EIA RS-232 connector pins so conventional modems can be attached.

The adapters provide users with the ability to perform diagnostic tests on the terminals connected to the SDLC loops. This is done by bypassing the 3601 terminal controller to directly access units connected in the loop configuration.

The Racal/Milgo unit is called the 36 LA and can operate at 1,200- or 2,400 bit/sec depending on the Milgo modem used. The 36 LA costs "under $600," according to a spokesman.

Compatibility is currently limited to the 3600 finance system, but the device can also operate with the retail and supermarket systems, the spokesman said.

Intertel, Inc. showed its EI 200 adapter, which has already operated with all three IBM 3600 systems, according to a spokesman. Ther Intertel unit costs $402 or $12/mo on a two-year lease.

Two Modems

General Datacomm Industries, Inc. of Wilton, Conn., introduced a full-duplex 1,200 bit/sec modem designed for dial up applications. Called the 212A, the data set is compatible with the Bell 103 and 212A modems and can operate in asynchronous mode at 300 bit/sec or synchronous mode at 1,200 bit/sec.

The GDC 212A has both local and remote diagnostic capabilities in addition to auto speed recognition. It costs $795 and is scheduled for delivery in the first quarter of 1978.

General DataComm also showed the LDM-1 limited-distance modem that can handle data rates ranging from 1,800 bit/sec to 19.2 kbit/sec. The unit can operate over two-wire and four-wire facilities in either half-duplex or full-duplex mode and costs $795.

Sidereal Corp. came from Portland, Ore., to introduce its Micronet II system, which allows users to access Telex, TWX and dial-up facilities with the same terminal.

The Micronet II uses a Digital Equipment Corp. Decwriter or LA 120 teleprinter with a buffer based on a Motorola microprocessor unit. The buffer has a storage capacity ranging up to 48K and allows the user to eliminate the paper tape required with teletypewriters, Sidereal said.

Micronet II features include automatic refile, an address directory of up to 250 "commonly called numbers," diagnostics, unattended transmission and multiple addressing, a spokesman noted. It costs $7,000 to $10,000 depending on configuration.

Infoswitch Enhanced

Datapoint Corp. added several computer-controlled features to its Infoswitch telephone cost-control system. They include a long distance control system a station message detail recorder and automatic call distributor (ACD) capabilities.

The Infoswitch system was designed to provide users with detailed data on phone usage and provide specific printouts on call patterns according to station number.

American Satellite Corp. used a dedicated earth station made by Fairchild and set up outside the conference hall to demonstrate a simultaneous transmission of digitized voice and high-speed data plus facsimile over a 56 kbit/sec link.

Digitech Industries, Inc. of Ridgefield, Conn., showed an enhancement of its Pacer line monitor that allows users to test the maintenance routines built into the Bell Dataspeed 40 Model 4 CRT terminal. The added "List-B1" features include a double expanded compiler which uses a high-order machine language, seven programmable read-only memory sockets for the Dataspeed 40/4 and a test program.

The Dataspeed features add $1,095 to the cost of a basic Pacer test system. The features can be added to existing units at the factory. The full Pacer line monitor costs $15,230, including a CRT.

Port-Sharing Unit

Teleprocessing Products of Los Angeles introduced its Model TP-12 port-sharing unit that connects two separate central site modems to one computer port. The modems, which can operate in either multipoint or point-to-point nets, costs $540.

Racal/Milgo also showed an intelligent clustered programmable terminal system that was described as an engineering prototype. Called the XP-4, the system includes a controller with three Intel 8080 MPUs.

Introduction of the terminal system has not yet been set, but depended in part on user reaction at the TCA conference, a spokesman said.

Bell Adds Multiplexer System, Hints at Dataphone Upgrades

SAN DIEGO — The Bell System showed one new product and talked about another at the annual Tele-Communications Association (TCA) conference here recently.

A multiplexer system designed to operate on private lines was introduced. Called the Dataphone Data Multiplexer, the system can handle 16 asynchronous lines at speeds up to 1,200 bit/sec between a terminal and the multiplexer, according to a spokesman.

Between multiplexer units, the system operates in synchronous mode at 2,400-, 4,800- or 9,600 bit/sec. Up to three circuits can be supported at remote sites, providing for a maximum system configuration of one master station multiplexer and three remote multiplexers, the spokesman said.

A master station at the DP site includes a multiplexer and a line control unit, the Model 1800A, which selects speed and performs diagnostics. This configuration has a proposed cost of $365/mo under an intrastate tariff application filed recently with the California Public Utilities Commission.

A remote configuration includes only the multiplexer, designated the 1200A, and can be located either at a user or phone company site. The remote unit costs $170/mo at the user's location and $175/mo at the phone company central office.

A possible restructuring of Dataphone rates was mentioned in a speech by Gordon Hough, board chairman of Pacific Telephone and Telegraph Co. Users who now have Dataphone service on a seven-day basis could get usage-sensitive pricing.

"We will be offering improvements in switching that will make it possible to use transmission circuits at the times users find most convenient. And users will be charged only for the times of transmission," Hough told the conference attendees.

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Manager Awareness Urged

Financial Goals Seen Vital to Equipment Choice

By Ronald A. Frank
CW Staff

SAN DIEGO — Telecommunications managers should be aware of the financial goals of their company when evaluating vendor equipment. This was the consensus of opinion of a user panel at the recent Tele-Communications Association (TCA) conference.

The telecommunications manager is only part of the total corporate picture, according to Donna Parker of Envirotech Corp., and therefore the acquisition of communications equipment should fit in with the financial policies of the firm.

When a purchase vs. lease decision is under consideration, the telecommunications manager should determine whether the type of equipment is covered by existing company insurance, according to Alexander Guba, who is on the telecommunications staff at Allstate Insurance.

Parker said most managers who handle communications are too timid to check into where their responsibilities lie in the corporation. The acquisition of up to $10,000 worth of equipment is usually not too much of a problem, but beyond that figure, the manager must consider where liabilities lie if things should go wrong.

Maintenance

Erle Whitney of Bunker Ramo Corp. told attendees that a contract for communications equipment should ideally contain a guarantee that there will be no hike in maintenance costs. If this is not possible, allowable increases should be clearly spelled out, the panel agreed. The vendor's warranty as to what can be supported and replaced without charge should also be clearly delineated, they said.

Critical Clause

A critical clause in a contract for communications equipment specifies that the devices cannot be assigned to a third party without the permission of the user, Parker said. This condition arises if the vendor should go out of business or otherwise make a financial arrangement with a third paty. If the "no-assignment" clause is put into the contract, then the user must be notified, she told the attendees.

Software

A TCA member in the audience said there was a similar risk when users acquire equipment which requires proprietary software. In one case, a vendor was required to place software documentation crucial to the reprogramming of a communications device in escrow with a local bank. Under a contract, this user would get access to the software if the vendor was not able to provide the necessary support, the member said.

CW
At TCA

In House

The panelists agreed the best protection for the user would be to develop in-house maintenance and software capabilities.

With the required level of in-house expertise, the user is less vulnerable to services that are later not fulfilled by the equipment supplier.

Whenever communications equipment is being evaluated, the telecommunications manager should consult with financial, legal, engineering and research departments, he said.

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System Helps Las Vegas Police Beat the Odds

Special to CW

LAS VEGAS — A computer-based datacommunications system that gives patrolling police officers instant access to local, state and federal crime files is making it harder for visiting bad guys to beat the odds here.

Built by Kustom Data Communications of Chanute, Kan., the system provides a means of dispatching police vehicles and transmitting information on stolen cards, outstanding warrants and missing persons to officers on patrol.

The system is comprised of a Digital Equipment Corp. PDP-11/45 minicomputer with 64K words of core memory, two DEC TU10 magnetic tape drives and three RKO5 cartridge disk subsystems. The system supports full-duplex communications between the computer and up to 75 plasma display terminals mounted in police patrol cars.

Kustom provided a packaged software system developed specifically for law-enforcement computer-aided communications.

Among its benefits, the computer-based system enables supervisory personnel to monitor patrol personnel because it provides a record of how long it took each officer to respond to an incident and how long he was at the scene.

More importantly, however, computer-aided dispatch frees voice channels for pursuit and emergency purposes.

Because transmission speed over the UHF channel is 1,300 bit/sec, each message is on the channel for a fraction of a second - far less time than it would require to transmit the message by voice.

In addition to speeding up the dispatching of police vehicles, the city's computer-controlled communications system gives patrolling officers instant access to a number of crime files, including the National Crime Information Center (NCIC).

Under Stress

Las Vegas imposes unique stresses on police communication networks. The city plays host to large numbers of short-term visitors — as many as 11 million per year, or 50,000 per day in a city with a permanent population of only 275,000 people.

Coincidental with this large number of visitors has come an increasing incidence of crime, and as a result, the city now has the second highest crime rate in the country.

To maintain order in the city, the Clark County Sheriff's Office (the Las Vegas Police Department and the sheriff's office were merged in 1973) has 713 officers and keeps 35 to 70 vehicles on patrol, with an average of 45.

This number of patrol units, combined with a rising number of incidents, however, had clogged conventional voice communications channels so much that response times to dispatchers' instructions were seriously affected. Delays ranging from five to 30 minutes in handling an officer's inquiry were not uncommon.

With the PDP-11/45-based data communications system, however, Las Vegas police dispatchers are handling 50% more than the previous system allowed with no increase in personnel and response times to an officer's query have been cut to an average of 20 seconds.

The PDP-11/45's control over the highly efficient dispatching system that handles the movements of Las Vegas police vehicles starts when a call comes in to one of the six complaint consoles located in the communications center.

The console operator first keys the incident into a Kustom CRT terminal using a mask generated by the PDP-11/45 to aid in questioning the caller.

The operator fills in the blanks on the screen following each question — address of the

(Continued on Page 36)

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System Boosts Police Odds

(Continued from Page 35)

complaintant, nature of the call, etc.

As soon as the operator keys in the address, the PDP-11/45 feeds the information to an IBM 370/145 database system to perform address verification.

The 370 supplies the zone, the district and the grid of the address back to the PDP-11/45 dispatch computer.

If the address is invalid, the operator is informed on her CRT screen within three seconds, enabling a query of the caller further while he or she is still on the telephone.

Transfer to Dispatch

When the complaint operator has keyed in all the required information, it is transferred to the dispatch console responsible for the region in which the incident was reported.

The dispatcher then reviews each event, selects the vehicles to be assigned and transmits the event directly to the unit through a high-speed digital radio transmission link.

When the police vehicle receives the data, acknowledgement is automatically sent back to the dispatcher and is displayed on the CRT screen.

At the Scene

When a patrolling officer arrives at the scene, he keys in his arrival. The dispatch computer displays the new status of the arriving vehicle on the dispatcher's CRT screen and logs the time. When the officer finishes the call, he enters a disposition code.

The system also logs all events over a 24-hour interval on one of the disk systems.

The two TU10 tape systems log every transaction occurring on the dispatch system. Tapes are replaced every 24 hours and are entered into the database computer for long-term storage and analysis.

Police vehicles have keyboard and 242-character display for communications between officers and the data base. Response time averages 30 seconds.

Device Allows Port Sharing

CHATSWORTH, Calif. — Micom Systems, Inc. has unveiled an intelligent, microcomputer-controlled port-sharing device.

The Micom 603 transaction concentrator permits four terminals to be connected to one computer port, either directly or via modems, according to Micom.

The 603 is buffered and lets terminals of different speeds transmit to a single computer port, it said.

The four terminals connected to the concentrator interact with the computer as if they were directly connected to the port. Reportedly, any terminal can input an inquiry message at any time.

If the port is in use by another terminal, the message wil be stored and placed in a queue and delivered on a first-come, first-served basis as the computer port becomes available, with the computer port being "switched through" to the terminal for the duration of the response message from the computer, the company explained.

The 603 is designed for use in a simple transaction processing environment where a number of data terminals operating in inquiry/response mode are connected to a central computer.

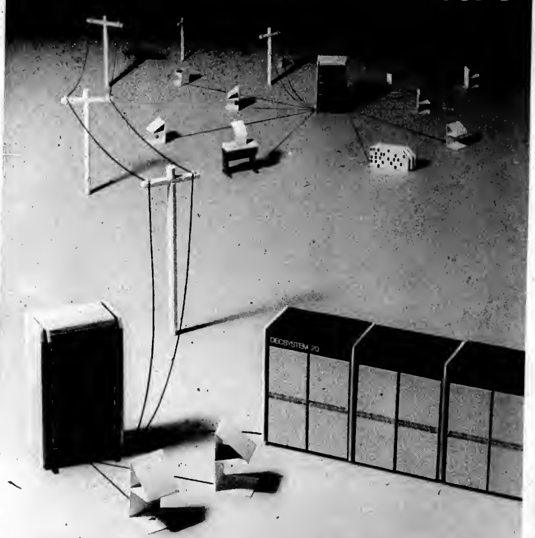
The terminals are typically Teletypes or Teletype-compatible.

The concentrator can handle asynchronous transmission speeds from 50- to 2,400 bit/sec in Ascii.

The 603 comes with an RS-232C serial asynchronous interface. Integral modem modules compatible with Bell 103 and 202 modems are available for custom configurations.

The 603 is priced at $2,000, a spokesman noted from 9551 Irondale Ave., Chatsworth, Calif. 91311.

Smart/Mux Solution Number 1



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Wescon Speaker Predicts
Memory Innovation in Store for Users

By Toni Wiseman
CW Staff

SAN FRANCISCO — While some signs of maturity in the field of semiconductor memory are becoming discernable — particularly in the areas of design quality and product reliability — the pace of innovation seems little diminished, according to a speaker at the recent Western Electronic Show and Convention (Wescon '77) here.

A host of recently announced or soon to be introduced products provides the user with a new generation of devices with superior characteristics for a wide spectrum of applications, Dr. Paul Schroeder of Mostek Corp., said.

N-channel metal oxide semiconductor (NMOS) memory "continues to be the dominant technology in semiconductor memory, with more advanced forms moving into both higher speed applications previously served only by bipolar and into some very low power areas" that until now were exclusively the domain of complimentary metal oxide semicoductor (CMOS)—memory, Schroeder said.

The overwhelming proportion of mainframe and general-purpose devices use NMOS silicon gate or some variant, such as two-level poly, he noted.

"High-performance versions, which employ shallow (preferably implanted) source drain regions and scaled device dimensions, are beginning to appear which may significantly challenge bipolar in the very high speed (in excess of 50 nsec access) range, although the fastest speeds are still the exclusive preserve of bipolar devices," he stated.

"At the opposite end of the spectrum," he noted, "extremely low-power, static memories have been introduced which employ NMOS silicon gate augmented with high impedance poly resistors.

"Memory cells implemented in this technology have standby currents comparable to CMOS while retaining the cost and speed advantages of the simpler NMOS process.

"Because of these advantages, it is likely this form of NMOS will largely displace CMOS in the low power/batery back up [random-access memory (RAM)] market," Schroeder said.

Despite the overriding presence of NMOS in the field, other technologies, especially integrated injection logic, are being used to achieve cell areas comparable to those in MOS, he noted.

"Dynamic concepts, previously an MOS exclusive, are now being introduced to bipolar," Schroeder said. If these efforts are successful, the cost and density of MOS could be reduced.

However, the gap is sufficiently great that it is unlikely that a major technology shift to bipolar will occur for main memory applications in the near future, he noted.

Schroeder noted that several product areas are showing growing interest — 4K static RAMs, for instance. Two main lines of development have emerged, one aimed at speed and the other at power, he said.

In the high-speed area, sub-50 nsec access time is the universal goal and both MOS and bipolar devices are or will soon be available, he told his audience.

At the other end of the spectrum, devices with 200 nsec acess times have been introduced that provide dramatic power reductions over previous NMOS statics, he said. The successful implementation of a static cell which employs near-intrinsic polysilicon load resistors and the application of dynamic curcuit techniques to the peripheral circuitry are responsible for this advance, he pointed out.

Most of the controversy that has accompanied dynamic RAM progress has died down, at least temporarily, with industry consensus on a single 16K (as well as 4K) multiplexed specification, he stated.

Schroeder wondered whether a large call for charge-coupled devices, which have reached the 64K density level, may have to wait for smaller cells, substantially faster operation, less expensive fabrication or higher density to make the economics of the technology more attractive.

Bits & Pieces

Seminar on Microfilm Set To Debut in New York

NEW YORK — The American Management Associations will be holding its "Microfilm in Records Management" seminar here Nov. 14-16.

The course agenda includes such topics as "System Considerations of Microfilm in Records Management," "Quality Controls in Micrographics," "Indexing Microfilm," "Technology of Micrographics," "Legality of Microfilm," "The Microfilm System" and "Computer Output Microfilm [COM] in Records Management."

The course instructor will be Robert F. Williams, president of Cohasset Associates, Inc. of Chicago.

The seminar will also be held Dec. 14-16 in Atlanta and Jan. 11-13 in Chicago.

Registration fees are $480 for non members and $420 for members; team discounts are available.

Registrations can be made by contacting the organization at 135 W. 50th St., New York, N.Y. 10020.

Kit Backs Output Design

NEW YORK — A device to assist users in the design of hard-copy output has been introduced by Magic Chart, Inc.

The Magic Chart Kit consists of a transparent mylar polyester chart plus marking pen, pencil and eraser. The chart can be placed over printouts to determine alignment and spacing; printouts can also be designed on the chart surface.

The kits are available in both 6- and 8 line/in. format and cost $25 each. Quantity discounts are available.

Custom charts can also be ordered, the firm noted from 25 Broad St., New York, N.Y. 10004.

VCI Plans Seminars

CHERRY HILL, N.J. — Value Computing, Inc. (VCI) will hold four seminars on production control in computer operations environments.

The seminars are scheduled for Oct. 27 at the Hyatt Regency in Atlanta, Nov. 11 at the Hyatt Regency in Chicago, Nov. 23 at the Marriott Motor Inn in Newton, Mass., and Dec. 13 at the Indianapolis Hilton in Indianapolis.

There is no charge for the seminars. Interested persons should contact VCI at 300 VCI Building, W. Marlton Pike, Cherry Hill, N.J. 08002.

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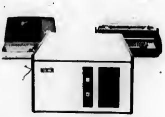


Shrewd Deals Help Blue Cross Save $800,000

By Philip H. Funk Jr.
Special to CW

At New Hampshire-Vermont Blue Cross and Blue Shield, tight DP budgets are the normal method of conducting business. As a nonprofit service organization, we have an obligation to subscribers to control administrative claims processing costs as tightly as possible, while providing high-quality service.

Since DP operations account for approximately 15% of the corporate budget, stretching the DP dollar has considerable effect on overall administrative costs. Dollar stretching has enabled us to reduce the DP cost per processed claim from 52.1 cents in 1974 to the current level of 43.4 cents, a reduction of 17% during an inflationary period. This cost reduction represents a savings of over $800,000 since 1974 and was accomplished without sacrificing performance or quality, both of which have improved.

Cost reduction methods employed are separated into four main areas: hardware, supplies, software and personnel.

Hardware Savings

Dollar stretching in the hardware area requires managing the growth of the DP installation, resisting the temptation to install the newest equipment and selecting the most favorable financial terms for selected equipment. Financial alternatives considered included long-term leases from the vendor, third-party leases and purchase.

Each of these alternatives has been employed at Blue Cross and Blue Shield at one time or another, although no equipment is currently on lease from a third party.

Managing the growth of the installation is essential in order to take advantage of long-term financial arrangements. Our 500K-byte IBM 370/145 has been installed since December 1973 under the IBM Term Lease Plan. This has enabled us to hold our CPU costs constant for the past four years. The last time our CPU costs were lower than the current level was in mid-1971.

Although the system has been running consistently at 85% utilization for the past two years, software changes have enabled us to meet increasing workload demands. These changes are discussed later in this article.

Installed peripherals include two IBM 3211 printers, 10 IBM 3420-3 tape drives and 24 Control Data Corp. 33301 disk storage units. Both the printers and disks are on long-term leases from the manufacturer. Purchase and lease-back alternatives are being investigated for the printers to see if more favorable terms can be found.

The tapes were purchased in November 1976. Disks will be upgraded to CDC 33302-11 disks next March and April. In all of our lease or purchase decisions, factors such as the cost of money, projected maintenance increases, useful life of the equipment and accrued purchase credits are considered.

Also installed are 42 local CRTs (IBM 3277) and five remote CRTs (IBM 3275). Since users projected a long-term demand for use of the applications supported by these CRTs, financial analysis indicated that purchase was the best alternative.

For data entry, we use two Mohawk Data Sciences 2400 key display systems with 37 keystations. In this particular area, we took advantage of terms in our lease agreement to extend the lease to a total term of seven years, thereby saving more than $52,000 over the contract term.

Printing Changes

Acquisition of consumable supplies is another area that has produced major savings. Early in 1975, we made several

(Continued on Page 39)

Hard copy made easy.

With the help of a high-speed microprocessor, Hewlett-Packard combines exceptional performance and convenience in a new low-cost printer and printing terminal.

The HP 2631A printer and HP 2635A printing terminal with alphanumeric keyboard are the first members of a new Hewlett-Packard family of hard copy terminals.

Each machine was designed to give you a number of high-performance features. And both can support a variety of interfaces, including RS232 and CCITT.V24, to fit into systems made by HP and other manufacturers.

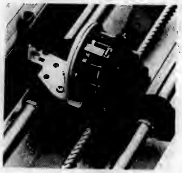
Bi-directional printing increases throughput. Both printers zip along at 180 cps in both directions, depending on your line layout. The microprocessor chooses the quickest path, and increases the speed even more by suppressing leading and trailing blanks.

High-speed slew for columnar data. When the microprocessor senses more than ten blanks in a row, it slews the print head at 45 inches per second to the next print position.

Three ways to print. The Character Compress/Expand Modes let you print more data on a page and emphasize points with headlines and titles. You can get as many as 132 characters on an 8-inch line, or 227 on a 14-inch line.

High-quality print, with six copy resolution. A 7 x 9 dot matrix (versus the usual 7 x 7) gives you clear, crisp printouts, right down to the sixth copy and meets the 128-character USASCII standard. And the extra two dot rows allow true underlining and descenders without character blurring.

Programmably interchangeable character sets. The HP 2631 can be made to print alternate character sets without reconfiguring the printer.



Long lasting, quick change print head saves service calls. The 9 wire print head is conservatively rated at a 100 million character life-span. It's also self-aligning. When you finally replace the head, you can do it yourself in a couple of minutes.

Long-life cartridge ribbon for a clean change. With a life span of at least 10 million characters, this innovative drop-in cartridge takes the mess and trouble out of ribbon changes.

Self-test for quick status checks. One key tells you if the printer is ready to go. If it isn't, the self-test feature helps you isolate the problem, reducing the time and cost for repairs.

Run everything under program control. All the features described and more can be programmably controlled. The software can take you in and out of the various modes. Or you can make a change yourself using one of the front panel switches or keys.

In a network or as part of a standalone system, HP now makes it simple to get the hard copy you need. If you'd like to see our printer or printing terminal in action, call the Hewlett-Packard sales office listed in the White Pages and ask for a computer systems representative. Or send us the coupon.

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File Keeps Tape Safe From Fire

BLUE BELL, Pa. — Univac has introduced a tape file that reportedly provides fire protection for stored magnetic media.

The Victor Fire Master is a three-drawer file which has successfully passed the Underwriter Laboratory's fire endurance test and explosion test.

The unit sells for $1,892 from the firm at P.O. Box 500, Blue Bell, Pa. 19422.

Blue Cross Cuts DP Costs $800,000

(Continued from Page 38)

changes in our use of standard stock paper. We switched from standard wide list stock and printing at six line/in. to stock paper designed for printing at eight line/in., thereby achieving approximately a 25% savings.

At the same time, the installation of two 3211 printers (replacing three 1403s) allowed us to switch from expensive multipart paper to printing multiple copies. The 1975 savings realized by these changes was over $1,200/mo. A third change was a switch to a less expensive grade of paper, which further reduced the cost of consumable supplies.

Ribbon reinking has also proved to be a valuable tool. With the cost of new ribbons more than double the cost of reinking, we have been able to decrease our ribbon costs by over 30% through this method.

Savings in all the above areas have been increased through competitive bidding. On most large orders, we are able to select from several vendors to obtain the price and quality that best suits our needs. Competitive bidding on magnetic tapes, for example, has saved us approximately $1.50 per reel of tape.

Savings accruing from software are perhaps harder to quantify in terms of dollars. However, the installation of packages such as the Total data base management system (Cincom Systems); CA-Sort-II, a fast sort merge (Computer Associates, Inc.); Fats tape certification program (Innovation Data Processing); and the Westinghouse Dump/Restore program have enabled us to extend the useful life of installed hardware.

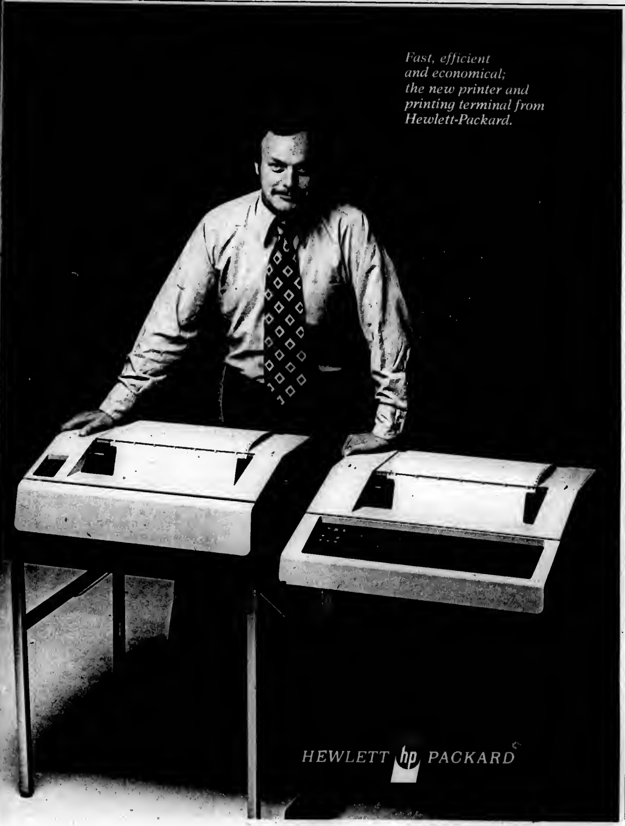
Improvements to our applications software have also shown substantial reductions in run times. Our teleprocessing executive, based on Btam, permits multitasking of teleprocessing and provides an average response time of less than two seconds. The Epat tape library system (Software Design, Inc.) resulted in direct savings because its installation permitted removal of two tape drives and a reduction in periods of maintenance coverage.

Although our workload has been increasing at an annual rate of about 10%, we have reduced our work force by about 5% in the last three years and eliminated over 75% of overtime. Employee turnover has been reduced as a result of better training and motivation.

Our computer operations work schedule, which combines three 12-hour work days with alternating coverage on Sundays, provides for 24-hour, seven-day operations without overtime. A data entry incentive program [CW, June 28, 1976] has resulted in a 30% increase in operator productivity.

In addition to the dollar stretching techniques discussed above, improved understanding on the part of DP employees of the goals and objectives of the department and how they relate to corporate goals has enabled us to process an increasing workload with improved performance without corresponding increases in cost. In fact, our 1977 operating budget of slightly over $2 million is about $125,000 less than the 1975 budget.

Funk is the director of computer services at New Hampshire-Vermont Blue Cross and Blue Shield.



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Printer Based on Micro

NASHUA, N.H. — A microcomputer-based intelligent printing system reportedly able to generate variable-sized characters without requiring additional programming of the host CPU has been introduced by Dataroyal, Inc.

The IPS-7200 can function as a label printer, general-purpose output printer or as an application-programmable printer. The unit's 8080A microprocessor unit can be accessed through preprogrammed read-only memory chips that can be custom-programmed by Dataroyal, according to a spokesman.

The printer operates at 120 char./sec bidirectionally with up to 132 char./line. Line spacing is 6 line/in. with 10 char./in horizontal spacing.

Characters generated are 5 by 7 dot matrix and the character set is 64 Ascii characters and two special characters, the spokesman said.

Available Interfaces

RS-232 or current loop interfaces are available. The double-buffered unit can transmit at 1,200 bit/sec in IBM 2848, 2260, 1053 or teletypwritet-compatible protocols, Dataroyal said.

The IPS-7200 can expand its Ascii character set in 1/9 in. increments from 1/9 in. to more than 10 in. high, the spokesman claimed.

The printer sells for $3,950; OEM pricing is also available from the firm at 235 Main Dunstable Road, Nashua, N.H. 03060.

From Univac

Filer Holds Various Media

BLUE BELL, Penn. — An automated storage and retrieval system that can be configured to store magnetic tape reels, microfilm and punch cards as well as standard files is available from Univac.

The Lektriever 100 is available in 8-, 9- and 10-ft heights and occupies 34 sq ft of floor space. The maximum number of carriers in any unit is determined by storage media size requirements and the height selected.

Shelf Configuration

In the shelf filing configuration, the unit provides 1,234- to 1,586 file in. of lateral files. Two shelf pitches, one 11 in. and one 13 in., serve all standard media sizes, a spokesman said.

In the tray filing configuration, up to 8,352 filing in. representing more than 800,000 cards are provided. In the T-bar configuration, 880- to 1,234 filing in. are available, enough for several hundred magnetic tape reels, the spokesman said.

Prices of typical systems range from $6,400 for the 8-ft model to $6,700 for the 10-ft model. Univac can be reached through P.O. Box 500, Blue Bell, Pa. 19422.

Two Terminals Aid Data Entry

SUNNYVALE, Calif. — Two data terminals for industrial applications have been introduced by Data Pathing, Inc. The units are compatible with current Data Pathing equipment including other terminals, controllers and minicomputers as well as software, a spokesman noted.

The modular Intelligent Terminal (MIT) 134 includes a CRT and keyboard and features four screen-size formats and either normal or double-size characters.

The MIT 134 was designed for use in offices and supplements the previously announced MIT 133, which is used primarily in factory environments, according to the spokesman.

Two Versions

The Model 102 attendance terminal is available in two versions, each accommodating a different type of badge. Both units provide a four-digit clock display. The 102 has three programmable keys as an option that can be used for recording additional information.

The MIT 134 sells for $2,800 and rents for $58/mo on a five-year plan. The 102 sells for $1,900 and rents for $36/mo under the five-year plan. Data Pathing is at 370 San Aleso Ave., Sunnyvale, Calif. 94086.

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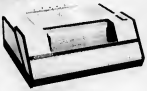

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Mini Makers Unveil CPUs and Systems

• TI Configures Commercial System

HOUSTON — Texas Instruments, Inc. has added three more members to its DS990 family of disk-based minis. The systems were designed for commercial end users as well as OEMs.

The models 4, 6 and 8 offer "extensive file management capabilities," TI claimed. They support multiple interactive users in a multilanguage environment.

Based on the firm's 990/10 CPU, the systems run under the DX10 operating system. All three can accommodate Cobol, Basic and Business Basic programming as well as Fortran IV with extensions, TI said.

The operating system provides multikey indexed file support; both batch and interactive processing can be run on the units, the company noted.

The Model 4, which can be used as a small multistation software development system or as a medium-scale application system, includes 128K bytes of memory; a 1,920-character Model 911 CRT with function keys and a separate numeric pad; 5M bytes of fixed and 5M bytes of removable disk storage; and either a single- or dual-bay

(Continued on Page 42)

• Wang Adds Mini For Novice Users

By Toni Wiseman
CW Staff

SAN FRANCISCO — Wang Laboratories, Inc. introduced several products, including a small system aimed at the first-time user, a printer/plotter and a graphics CRT, at the recent Western Electronic Show and Convention (Wescon '77) here.

Positioned between the Wang PCS-II minidiskette system and WCS/20 dual floppy, the WCS/15 is a full-purpose, diskette-based system for commercial, technical, scientific and educational applications including data entry, retrieval, editing and processing, Wang said.

The WCS/15 features a CPU with 16K bytes of user memory, a 12-in. CRT, keyboard and a single diskette drive.

The CPU has a standard random-access memory (RAM) expandable to 24K or 32K bytes; 700 bytes of RAM are dedicated to "housekeeping purposes," according to a spokesman.

A 42.5K-byte Basic language interpreter hard-wired in read-only memory translates and executes Wang's Basic instruction set,

(Continued on Page 42)

• Interdata Tops 16-Bit CPU Line

By Esther Surden
CW Staff

OCEANPORT, N.J. — The Model 8/16E minicomputer introduced recently by Interdata, Inc. reportedly provides users of the firm's 16-bit line with a direct upgrade path from their smaller systems to a CPU that can accommodate up to 256K bytes of memory.

The mini uses integral memory management hardware not found on Interdata's other 16-bit systems, a spokesman said. The Model 8/16E runs under an enhanced version of the OS/16 MT2 operating system and uses an extended Fortran IV language.

The system protects the user's software investment, however, since conversion to the OS/16 MT2 is "simple," he claimed. In addition, he said, users can move the peripherals used on their smaller systems to the larger mini.

Designed for use in scientific computation, process control, business DP and data communications applications, the Model 8/16E is in the range of the Digital Equipment Corp. PDP-11/34.

The memory management hardware allows

(Continued on Page 42)

Metal Part Producer Presses Out Orders

By Ann Dooley
CW Staff

BROCKWAY, Pa. — A manufacturer of heavy metal parts is grinding out orders using a minicomputer that has helped increase sales by speeding up almost every process, according to Michael Trunzo, DP manager at Brockway Pressed Metals, Inc.

Brockway chose a Burroughs Corp. B700 to replace an IBM System/3 because it was a "better overall system" considering the budget within which the DP department had to work, Trunzo said.

"It was more machinery for the money," he added. "Pricewise, it's hard to find a system that will give you so much."

Valued at $50,000, the system handles Brockway's 225-person payroll and its accounts payable, cash receivable, general ledger, sales analysis, budget and order tracking/implementation applications.

The B700 configuration consists of the CPU, one disk drive, two disk cartridges, one 160 line/min printer and two data recorders, one of which acts as a reader.

Previously, the work now processed on the B700 was performed by the System/3, but some very rapid growth made it difficult to retain that system, Trunzo recalled. "We needed more machinery with a better overall system that would enable us to process more information," he said.

Chosen for Service

Before going to the B700, Brockway looked at NCR Corp. and IBM equipment in addition to the Burroughs system. Because of its rural location, the company felt its best choice for service was Burroughs, Trunzo said. Brockway is located 140 miles from Pittsburgh, the nearest large city.

The B700 handles more than 160 programs, according to Trunzo. Burroughs did some of the programming and the rest was done in-house or by an outside software firm.

"We try to put it all together," Trunzo said. The order tracking system, one of the most recently developed, is turning out to be the most encompassing, he added.

Once an order is placed by a customer, a data base of fixed information is built around the order. The data file includes customer name and number, the part number, the quantities of each part ordered and the various operations through which each part must be routed.

Releases must then be issued to the production department to establish a production schedule. Next, the cost of the part is determined, including costs of the raw material and labor.

Throughout the process, reports are issued to the appropriate departments indicating the status of the part.

The usual files involved in most orders include the order file, the standard file that includes all of the costs involved and the labor and the raw materials file, according to Trunzo.

All of the information is keypunched onto cards, fed into the computer and routed to various disk files. The order tracking system branches out into all areas of the business and is used for almost "everything imaginable," Trunzo said.

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Small System Controls Firm's Diverse Interests

ST. PETERSBURG BEACH, Fla. — Resort Inns of America, the owner and operator of several hotels here, is using a small business system to gain increased control over its diverse business.

The company owns not only the hotels, but also has retail shops, an advertising agency, a hotel-oriented supply corporation and other hotel-related companies.

"Resort Inns of America is a rapidly growing corporation," Don Elliott, treasurer and controller explained. Because of that rapid growth, it decided it needed to automate, so it purchased a Century Computer, Inc., small business system.

"We became acquainted with Century when we bought one of its small tape computers from a dealer. The dealer has since become defunct and we have become a quasi-dealer ourselves," Elliott explained.

Presently the company has a larger, disk-based model. The disk-based system is responsible for the bookkeeping processing of three subsidiary corporations. It records and analyzes guest reservations for all five motels, records and analyzes all prior guest reservations for the past two years, follows through on promotional mailings to these prior guests, records and analyzes travel agent business (and follows through on personalized mailings to some 10,000 agents) and performs statistical analysis of all inquiries and the business that results from the inquiries.

"All programming is done by operating staff and input is accomplished by regular office personnel. We have telecommunications to the computer from the motels and two CRT terminals in the office," Elliott said.

Two members of management have portable terminals which enable them to communicate with the system from their homes, so "it is not unusual for input and querying to be going on over a 12-hour period," he said.

Basic accommodation data for the motels is housed in master files. Other files hold guest names (the chain does a 50% repeat business) and house the names and accounts of travel agents.

Reservations are centrally recorded and entered into the system daily, with a simultaneous entry made in the appropriate travel agent's file, updating his account.

"The Century 400 system prints out the reservations for the arrivals scheduled at each motel for the following day," Elliott said. "The system also prints out at scheduled intervals the lables for direct mail to previous guests."

Basic software for the system was provided by Century. Hardware consists of the CPU, 32K bytes of internal memory, 16-port multiplexer, two medium-speed line printers, one 10M-byte disk drive and disk controller, two CRT terminals with standard keyboards and the portable terminals.

Interdata Caps 16-Bit Line With 256K-Byte Machine

(Continued from Page 41)

the company to extend the system's physical memory beyond the previous limit of 64K bytes, the spokesman said. Program mapping is performed by implementing additional bits in the program status word.

Logical program space is viewed as 64K-byte areas, regardless of physical location. Additional instructions control the additional bits, the company explained.

A 16-bit extended selector channel handles mapping for direct memory operation to extended addressing areas, the spokesman added.

A Memory Protect Controller allows users to protect their software by allocating selected blocks of memory to either write protect, read/write protect or instruction execution protect, according to Interdata.

With this feature, memory can be partitioned into a maximum of 64 blocks, with individual protection for each block. Block sizes of either 512-, 1K- or 2K bytes are accommodated.

The revised operating system performs real-time, multitasking operations in an event-driven environment. The system manages system resources, including access to the processor, with up to 255 levels of priority defined by the user, Interdata said.

It also provides intertask communications and control facilities, including task-common and reentrant libraries, which allow users to create applications required by transaction processing, the company noted.

Another feature of the enhanced operating system is an embedded Command Substitution System (CSS). The CSS allows users to create operational procedures on disk, "permitting reexecution later with a single command," the spokesman said.

The Fortran IV compiler operates in about 21K bytes of memory and directly generates object code, according to Interdata. It is said to exceed the requirements of Ansi-standard Fortran.

A typical 128K-byte 8/16E system with 10M bytes of disk, CRT console, operating system and Fortran IV costs $27,645. The Fortran IV compiler costs $550 and the OS/16 MT2 operating system costs $1,700. Interdata is located at 2 Crescent Place, Oceanport, N.J. 07757.

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Wang Mini Suits Novices

(Continued from Page 41)

he added.

The CRT displays 16 lines of 64 char./line; a display with 24 lines of 80 char./line is optional. The CRT's cursor can be operated under program control using eight available cursor-positioning codes, the spokesman noted.

The WCS/15 has a standard single diskette or optional dual diskette drive which increases the standard 262K bytes of on-line storage to 524K bytes, Wang said. Access time is 14 msec on one track.

Communications options include Teletype or IBM 2741 protocols or batch transmission to or from a host system via IBM's 2780, 3780 or 3741 Binary Synchronous Communications (BSC) protocols.

The basic price of the WCS/15 is $10,200. With a second diskette drive and a 2231W matrix printer, the system costs $14,600.

Graphics Devices

Wang also unveiled its 2282 graphics CRT and 2231W-3 matrix printer. The two were designed to combine easily revised visual plotting and fast hard copy for a total approach to graphics that range from bar charts and pie charts to large engineering drawings and maps, Wang claimed.

The Model 2282 has a 12-in. diagonal screen with a 7-in. wide by six-in. high viewing area. The graphics matrix on the screen consists of 800X by 512Y addressable locations.

In addition to plotting line vectors, a 112-character Ascii set can be plotted on the Model 2282 in 15 different sizes, the firm added.

The CRT uses a standard line printer controller-CPU interface. When used with the Model 2231W-3 line printer, the printer cable plugs into the output connector of the 2282.

The 231W-3 printer provides a hard copy of the graphics information displayed on the 2282 CRT. The hard copy is generated by printing strips of 800- by 8 dots.

The Model 2282 CRT costs $3,600 and the 2231W-3 line printer costs $3,800 from Wang at One Industrial Ave., Lowell, Mass. 01851.

TI Configures Commercial Unit

(Continued from Page 41)

desk.

A licensed copy of the operating system and software development facilities such as a macro assembler, interactive source editor and overlay-supported link editor are available.

The Model 6, which can be used in larger data base applications, has a 128K-byte processor, a CRT and two 25M-byte removable pack disk drives.

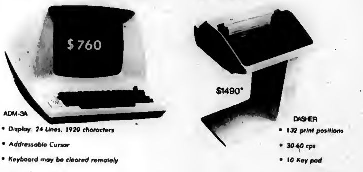
The Model 8, designed for large data base applications, includes the 128K-byte processor, the CRT and two 50M-byte disk drives.

The Model 4 costs $27,400 including operating software and installation; a hardware-only version without operating software and installation costs $24,500.

The Model 6 costs $40,600 including installation, operating software and a one-year software update subscription service. The hardware-only version costs $37,400.

The Model 8 with the update service, installation and software costs $50,800; the stripped-down version is priced at $47,400.

The systems should be available in late October, TI said from its Digital System Division, M/S 784, P.O. Box 1444, Houston, Texas 77001.



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Strategies — Part 1

Timely Measurements Ensure Reliable Operations

Special to Computerworld

Most companies are problem-oriented rather than technique-oriented. Successful businessmen recognize this and avoid letting any subjective element influence them in the search for proper methods to solve problems. This article attempts to provide management with objective methods to measure and evaluate current and planned computer operations and related systems development activities.

Top management wants to know how effective the management of each minicomputer site is. It is not just the minicomputer system's performance, but rather the performance of all DP activities at the site that needs to be measured.

This cannot simply be done by looking at the current costs vs. the planned costs of each site. This form of measurement reflects what has happened rather than what was possible. It measures the immediate effect of operating decisions but not the quality of those decisions.

In our approach to the evaluation problem, we begin by defining management planning for minicomputer systems. This method involves the identification of important planning tasks and use of a planning methodology that leads to development of "planned performance."

This takes into account changing minicomputer technical trends in hardware and software tools that affect production efficiency and cost effectiveness. This evaluation process should be repeated several times a year for each computer location.

Major Tasks

The seven major tasks in the planning process for each minicomputer location are:

- Determine current workload of the data center.
- Determine future workload requirements.
- Define workload capacity and performance of current configuration (hardware and software).
- Define projected (required) capacity and performance of minicomputer configuration (hardware and software).
- Determine user response times and other production requirements.
- Determine overall minicomputer site performance criteria.
- Determine planned costs and performance of the minicomputer site.

The current workload for each shift over the work week can be initially divided into three major categories: production, development and system overhead.

It is important to establish workload criteria because they tend to be overall guidelines for determining current utilization. The analysis of the current workload will provide sufficient data to determine:

- The hardware/software configuration(s) match to the job mix.
- The effectiveness of the scheduling procedure.
- The effect of data management options on timeliness and responsiveness of overall site performance (e.g., file management, data base management; on-line terminal data entry, data base inquiry and update; or batch processing options).
- The effect of minicomputer software tools on systems development and maintenance costs.
- The effect of minicomputer systems on capacity management, processing and cost/performance.

This is the first part of a two-part series on objective methods to measure and evaluate current and planned minicomputer operations and systems development activities. The article was prepared by the marketing department of Data General Corp.

Measurement Impact

Each of these categories should be examined in detail, because they exhibit different measurement impact on total system resources.

Production workloads can be divided into on-line or time-sharing and batch, either scheduled or unscheduled.

The emphasis in the DP production environment should be optimization of job mix processing throughput and user response time during each shift.

This requires the analysis of several approaches, including establishing special job classes for "must have" scheduled time-sharing and batch production, liaison with users to validate need for production during prime shifts, and tight control over unscheduled batch jobs to ensure that resources are not being abused by jobs that are not actually priority production jobs.

Standards, together with systems user discipline must be present to achieve an optimization of computer site resources and services.

Line Printers Ease Jams

HOUSTON — Southwestern System Services, Inc. has introduced a series of minicomputer line printers that incorporate a microprocessor which in case of a paper jam, allows the last few pages to be reprinted "at the touch of a button."

Called Paragon, the Model V29 model printer includes a Centronics Data Computer Corp. compatible interface, program-controlled horizontal and vertical tabs, absolute horizontal and vertical tabs, automatic bottom-of-page, automatic page heading and numbering, single-line or single-page print and built-in diagnostic patterns, the company said.

With the V29X, users can get 16K bytes of storage that records the most recent printed output in the micro's random-access memory.

The V29 costs $5,995 and the V29X costs $7,465. Deliveries will begin in January, Soutwestern said from Suite 110, 6116 Skyline Drive, Houston, Texas 77057.

In Applications, Technology

Micro Report Analyzes Growth, Outlook

By Frank Vaughan
CW Staff

PENNSAUKEN, N.J. — Since the introduction of the microprocessor by Intel Corp. in 1970, technical and applications developments have grown at an explosive rate, according to a report prepared by Infotech International Ltd. and distributed by Auerbach Publishers, Inc.

These developments have taken place in the areas of large-scale integration (LSI) technology, microprocessor architecture, applications and development systems, it added, noting that outside industry the impact of microprocessors will be considerable, with some forecasts predicting that most homes will have at least 10 microprocessors serving various domestic appliances.

Within industry, there will be considerable changes in the kinds of expertise required to produce microprocessor-based products.

"Interfacing microprocessors to memory and I/O devices poses many of the problems that are found in minicomputers and indeed, many of the same solutions are used. Typically, I/O is provided by bus structure and the flow of data is controlled by program, direct memory access (DMA) or interrupt mechanisms. Microprocessors tend to be less complex than minicomputers, and to alleviate difficulties caused by this, many manufacturers supply special hardware that simplifies the interfacing problem."

I/O Design

"I/O is a critical aspect of microprocessor system design: the high cost-effectiveness of the microprocessor chip in terms of providing processing power can only be realized if the I/O architecture matches the processor in efficiency," the report contended.

"Clearly the major determinant of the kinds of bus structures that can be implemented is the control signal configuration of the microprocessor chip, which is itself determined by the available pins.

"The user has considerable freedom in the way in which he allocates the pins to functions and different benefits can be achieved by different strategies," the report suggested. It goes on to outline several of these strategies and includes some of the tradeoffs that can affect the choice of the designs.

The explosive growth of microprocessors has caused some problems in definition, and definitions often fail to include devices which may be reasonably considered to be microprocessors, while including devices which might equally reasonably be considered not to be microprocessors, the report said.

The report summarizes the main characteristics of the microprocessor: it is an electronic logic device that consists of one or very few LSI circuits. Further, it is a stored program computer capable of being used both as a replacement for random logic and as a processing element in a computing system.

In examining the use of microprocessors, the report looked at seven applications areas:

- Process Control. The industrial uses of microprocessors are potentially enormous and almost every aspect of modern manufacturing techniques is amenable to logical control by computer devices, it said.
- Testing and Instrumentation. The report observed that instrument designers have realized the advantages of the use of micros. Designers are turning toward the application of microprocessors in a broad range of instruments, from the replacement for electrical power meters in households to smart, programmable instruments.
- Telecommunication. Infotech suggested that microprocessors are being applied in this field and hold considerable promise.
- Data Capture. This is reported to be a major growth area for microprocessors, used both as controllers in data capture terminals and in complex laboratory and industrial applications.
- Commercial DP. The report noted that "the DP world has not yet woken up to what micros are about; they are just beginning to."
- Portable/Personal Computers. Infotech discusses the use of microprocessors in the role of providing a low-cost, powerful personal computing capability.
- Consumer Products. The report predicts that many applications areas — other than calculators, watches and games — will emerge in the future.

Other topics in the first volume of the report include multi-microprocessor systems; evaluation and selection; design and development; software and manning.

Volume 2 of the set is a collection of invited papers from which much of the data in Volume 1 is drawn. The two-volume set costs $215 from Auerbach Publishers, 6560 N. Park Drive, Pennsauken, N.J. 08109.

Micro Bytes

MFE Reduces Prices On Two I/O Boards

SALEM, N.H. — MFE Corp. has reduced the price of two of its interface boards for the Model 250B digital cassette transport.

The average price of option 214PAR, which is for Parallel I/O for 8-bit computers, has been reduced 20% to $260. The price of option 204SER, intended for serial I/O for data communications, has been dropped 10% to $135, according to a spokesman.

OEM discounts are available, the spokesman said from Keewaydin Drive, Salem, N.H. 03079.

Free Catalog Lists Products

FAYETTEVILLE, N.Y. — Computer Enterprises is offering a free microcomputer catalog "Computerlogue" that is "star-dated" for this fall.

The catalog contains several hundred product listings from various manufacturers and contains the retail price, cash discount price and credit card price of every item.

The catalog may be obtained by writing to Computer Enterprises, P.O. Box 71, Fayetteville, N.Y. 13066.

Tool Inserts IC Packages

BRONX, N.Y. — OK Machine and Tool Corp. has introduced a tool that inserts both 14-pin and 16-pin integrated circuit packages into sockets or predrilled boards.

The INS-1416 includes a pin straightener and costs $3.49 from electronics distributors or directly from the firm at 3455 Conner St., Bronx, N.Y. 10475.

Polymorphic Has Diskette System

SANTA BARBARA, Calif. — Polymorphic Systems has introduced its System 8813, an 8080A-based, diskette-oriented microcomputer system.

The basic system comes with power supply, chassis, cabinet, 10-slot backplane, microprocessor card, floppy disk controller, 16K bytes of random access memory (RAM) and 3K bytes of read-only memory (ROM). It also includes a fan, keyboard with cable, floppy disk drive and two system disks. The system can accommodate up to two additional floppy disk drives, according to a spokesman.

Software for the system includes a disk operating system; disk Basic, with file handling structure; and assembler with a two-dimensional editor that is not line-oriented and a text editor that can edit any system file, the spokesman said.

Prices for System 8813 start at $3,250 from the firm at 460 Ward Drive, Santa Barbara, Calif. 93111.

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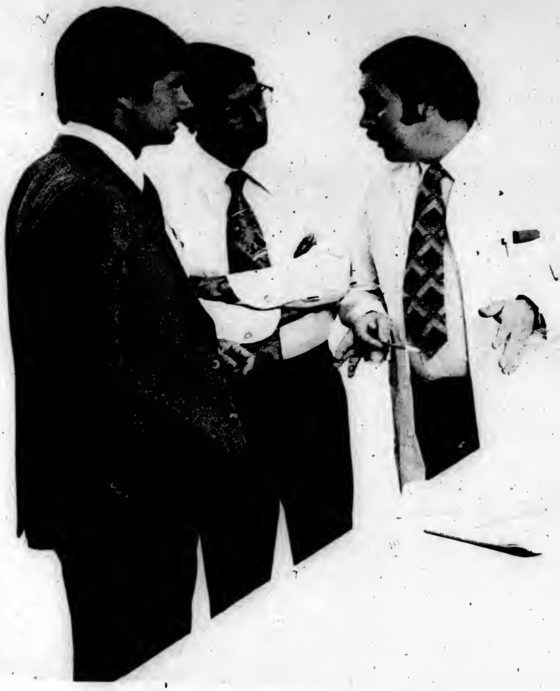

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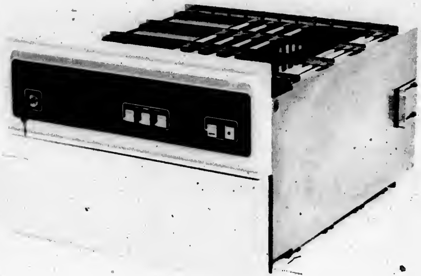

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Unit Uses PDP-8 Programs

SAN RAMON, Calif. — Pacific Cyber/Metrix, Inc. (PCM) has introduced a 12-bit microcomputer system that is reportedly software-compatible with Digital Equipment Corp.'s PDP-8 minicomputer family and sells for less than $1,000.

The PCM-12 incorporates Intersil's IM6100 12-bit microprocessor unit (MPU). The IM6100's instruction set is identical to the PDP-8's and the PCM-12 user can use all of the programs and operating systems developed for the PDP-8 family, a PCM spokesman claimed.

The basic price of $989 assembled and $679 for kits includes the MPU; a memory system that can be expanded to 32K bytes; front panel module with built-in bootstrap loader and control programmable read-only memory (Prom) chips; power supply; backplane bus structure; 15-slot cabinet; and user manuals, the spokesman said.

The system was designed for adding vectored priority interrupts and direct memory access. It also features an 80-line total transistor logic (TTL)-compatible bus.

PCM is located at 3120 Crow Canyon Road, San Ramon, Calif. 95483.

Camelot Offers DP Dictionary

ORMOND BEACH, Fla. — Camelot Publishing Co. has announced the printing of Donald Spencer's *Computer Dictionary*.

The dictionary contains, in addition to standard definitions, features on computer organizations, the metric system, biographies, programming languages, personal computers, history, computers in society, management, education and computer professionals.

The book stresses clarity, and definitions stand as independent units of explanation, according to a spokesman.

The book sells for $5.95 in paperback and $9.95 in hardcover from the publisher at P.O. Box 1357, Ormond Beach, Fla. 32074.

OTI Device Programs Eproms

EARLYSVILLE, Va. — Optimal Technology, Inc. (OTI) here has introduced a programmer for 2708- and 2716-type erasable programmable read-only memory (Eprom).

The programmer requires the use of one and a half I/O ports of any 5V microcomputer, according to a spokesman. The programmer is packaged on a printed circuit board and furnished with software for the Motorola 6800 DI or D2 kits or the Fairchild F-8 kit number 1, he said.

Assembled and tested with software, the programmer costs $59.95. The programmer without software but with software instructions costs $33 in a kit.

OTI is at Blue Wood 127, Earlysville, Va. 22936.

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Despite Unresolved Issues

Bank Terminals to Double by 1981: CSI

By Toni Wiseman
CW Staff

SAN JOSE, Calif. — Banking automation is caught up in a series of hassles ranging from consumer resistance and technological roadblocks to legal and regulatory decisions as to whether or not automated terminals should be considered branches of the installing financial institutions, according to Creative Strategies, Inc. (CSI).

The installed base of banking automation terminals, including on-line teller terminals (OLTT), automated teller machines (ATM) and point-of-sale (POS) devices, will more than double in the next five years, increasing in value from $906.5 million to $2.1 billion — a compound annual growth rate of 18.5%, CSI forecast.

The potential market for these terminals is "vast," the report said, noting there are some 43,000 financial institutions of all types in the U.S., encompassing 85,000 locations.

Nearly 61,000 OLTTs, valued at $715 million, are currently installed. CSI expects that figure to reach 117,250 units, almost double, in the next five years.

The 1976 installed base of ATMs is 5,250, valued at about $184 million. CSI predicts shipments of 18,250 units over the five-year period to 1981.

The installed base for POS devices in 1976 was estimated at 10,000 terminals, valued around $7.5 million. This market is predicted to grow to an installed base of 150,000 terminals by 1981.

In all three markets, CSI predicted an average price-per-unit drop of 15% to 20% over the five-year period.

However, before the ATM market can stablilize and begin a predictable growth pattern, several issues will have to be resolved. These include:

- Legal and regulatory interpretations as to whether these machines represent branch operations of a particular financial service institution.
- Antitrust issues related to the sharing of a common terminal.
- Economic justifications.
- Consumer acceptance.
- Development of the "debit card."

Banking Marketplace

A recent study conducted by Payment Systems, Inc. (PSI) showed that most financial institution marketing executives plan to be participating in some sort of electronic funds transfer (EFT) program within the next several years — or else have already begun. In fact, 93% of all commercial bank respondents predicted their institutions would have ATMs by 1980, CSI stated.

Likewise, 86% of all mutual savings banks and savings and loan associations anticipated they would have at least one ATM by 1980, the PSI study showed, and only 5% of all financial institution respondents believed they would not be participating in a POS system within the next five years.

"Of the 85,000 financial service locations which are potential installation sites for OLTTs and ATMs, some are more likely locations than others. Manufacturers of these terminals generally (though not exclusively) direct their marketing to FSIs [financial service institutions] with over $25 million in deposits," CSI said.

The market for OLTTs is centered around commercial banks, the report said, noting that currently, about 10% of all banks are on-line, while over 75% of savings and loans

(Continued on Page 50)

Young HP President; Hewlett Moves Upstairs

PALO ALTO, Calif. — John A. Young, executive vice-president in charge of the computers, instruments and components groups, has been elected president of Hewlett-Packard Co.

He succeeds William R. Hewlett, who becomes chairman of the executive committee and will continue as chief executive officer. Hewlett will be 65 in June.

The changes are effective Nov. 1. Dean O. Morton, vice-president in charge of the medical electronics group in Waltham, Mass., will relocate to assume direction of the instruments, medical and analytical groups. Executive vice-president Ralph Lee will handle the computers and instruments groups as well as calculators.

Home Computer Market Seen Topping $1.5 Billion by 1985

By Toni Wiseman
CW Staff

SAN FRANCISCO — What started as a computer hobby market barely three years ago has all the promise of becoming the next billion-dollar market for electronics — particularly since the transition from hobby computer to home computer has already happened, speakers at Wescon 77 said here.

By 1985, the market for home computers is expected to be over $1.5 billion, with an additional $800 million going into small business applications, the speakers predicted.

In summarizing the situation, Frank J. Burge, vice-president of Regis McKenna, Inc., noted "Macy's of California is selling computers . . . So are the 6,000 outlets of Radio Shack . . . and Heath Co. Can Sears and Montgomery Ward be far behind?"

Bob Wickham, president of Vantage Research, noted that home computers are only one segment of the personal computer market — a market which today has an installed base of some 50,000 units. This Christmas season should add another 30,000 to 50,000 to that figure, he said.

CW at Wescon

The personal computer market will have both consumer and professional segments, with the hobby market occupying the area in which the two overlap. All these computers will be characterized by a CPU with random-access memnory (RAM) program storage, user programmability, high-level language, interactive operation, alphanumeric keyboard and display, tabletop size and single user orientation, he said.

The professional segment includes personal computers directed at engineering, scientific and business users for individual problem solving and data processing, such as those used in doctors' offices and by CPA firms, he said. Prices in this market range

(Continued on Page 52)

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Schweber to Distribute DG Micronova Line

WESTBORO, Mass. — Data General Corp. is expanding its sales techniques by offering Micronova hardware and software through Schweber Electronics Corp., a distributor of electronics and microprocessors.

New Channel Opened

Herb Richman, senior vice-president of DG, said the move opens up a "major new channel of distribution for the computer industry.

"We will now be selling a full computer system complete with software through the same off-the-shelf distribution channels used to achieve maximum market penetration for semiconductor parts," he added.

DG field service contracts will be available on goods sold through Schweber, Schweber said.

Under an agreement with DG, Schweber will stock and sell DG's line of 16-bit microprocessor products including the Micronova processor, chips, boards, software, packaged computers and peripheral equipment.

Schweber's technical sales staff will offer the Micronova line locally throughout the U.S.

Individual Needs Addressed

Seymour Schweber, president, said this represents the first step taken in years within the industry to address the increasing individual needs of local customers of computer equipment.

"The computer industry itself admits that it doesn't know in what exciting new ways customers will put their equipment to use next," he said. "Yet those same users need all the assistance they can get in understanding how to apply complex microprocessor technology to their own retail business, service operation or whatever."

Terminals Seen Doubling

(Continued from Page 49)

and mutual savings banks are on-line.

CSI forecast that about 80,695 terminals will be installed by 1978, with over 92,200 at 23,850 locations by 1979. By the end of 1980, nearly 60% of all large institutions will have systems installed with more on order. This would account for 104,775 terminals serving 26,775 banking locations at that time, it said.

Meanwhile, the market for ATMs and cash dispensers should grow from 5,250 installed units, at an average price per terminal of $35,000, at the end of 1976 to a total of 23,500 units, costing $30,000 per terminal, in 1981, the report suggested.

"One obvious trend is currently taking place in this industry. Though they are $10,000 to $20,000 more expensive, full-service ATMs are being installed on a three-to-one basis over cash dispensers," CSI commented.

Competitive Factors

Burroughs continues to dominate the OLTT industry, followed by NCR, IBM and Bunker Ramo. These four account for some 85% of the total installed base today, CSI reported. That status quo should remain virtually unchanged for the next five years, it added.

The ATM/cash dispenser market is strongly dominated by Docutel Corp., although IBM and Burroughs, because of their strong reputation in the financial industry and their "total systems" approach, should grow considerably in the next five years, the report observed.

Capital Requirements

Capital requirements appear to be the major barrier to entrance into this market, since new entrants are required to finance a considerable market, CSI said.

The POS device market's main force is Transaction Technology, Inc., a subsidiary of Citibank Corp., and is followed by Datatrol's Amcat terminal, CSI said.

In the next five years, however, "AT&T's Transaction Telephone should emerge from the pack to throughly dominate the market," CSI said.

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No Free Lunch

Micro Designers Facing Choice of Languages

By Toni Wiseman
CW Staff

SAN FRANCISCO — Microcomputer programming languages are becoming even more prolific than micros themselves, attendees of the Western Electronic Show and Convention (Wescon) were told here recently.

As a result, the designer is faced with choosing among Basic, Fortran, Assembly languages and a host of proprietary offerings, according to Carol Ann Ogdin of *EDN Magazine*.

And, she noted, some of the languages touted as "standard" simply are not.

Taking a look at the alternatives facing a designer, Ogdin said, there is no such thing as a free lunch. "Programs that result from a compiler are generally longer and require more time to execute than those written by a highly skilled Assembly language programmer," she said.

However, the traditional argument in favor of Assembly language may be out of date, she cautioned.

"Using some of the most sophisticated compilers, such as IBM's Fortran-H, it is hard for a mediocre programmer to generate programs that are as efficient. Even good programmers have a hard time beating that translator's efficiency," she said.

"Such optimizing compilers haven't yet been generated for micros, though," she admitted.

Real Trade-Off

The essential trade-off a designer must make is between the cost of program development and the life cycle cost in production, Ogdin told the audience. There is a significant part of the cost of writing programs which is not affected by the language choice, she pointed out.

"The analysis of the application, algorithm selection and program design activities usually proceed without being affected by the language choice," she said.

"Some outrageous claims of '10-to-1 reductions in programming costs' have appeared in print, but these refer solely to the coding and testing time, not design effort.

"In well-designed programs, more than two-thirds of the dollars are spent before code is even written, so the savings may not be as great as the seller would like to claim," she stated.

In order to achieve overall reductions in program size — not just speed — the entire program should be written in Assembly language, she said.

"If the anticipated production volume is one to two, there is hardly justification for using Assembly language.

"If, however, five or more copies of such a program are required, the extra programming effort to save the cost of five or more memory cards may be worthwhile," she said.

The microprocessor represents an extreme case since the number of units of production may be in the hundreds or thousands and the additional software development costs can therefore be recouped quickly.

Ogdin predicted the trend toward high-level languges will continue, especially in light of recent Department of Defense (DOD) language standardization efforts and the continued increase in the size of program storage read-only memory (ROM).

DOD is evaluating future language options for standardization, she remarked, noting the general acceptance of one particular language for real-time control applications will mean more compilers available for general use.

CW
At Wescon

In addition, larger ROMs mean the incentive for Assembly language programming will diminish and compilers and interpreters may be distributed in ROM form, she said.

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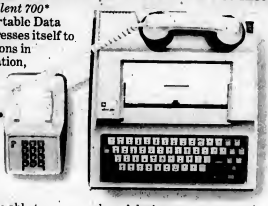

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Products Bow at Western Electronics Show

Adar Unveils MX-17 Micro Test System

Adar Associates, Inc. introduced its MX-17 microprocessor test system at the Western Electronic Show and Convention (Wescon) in San Francisco.

Designed as a low-cost, high-performance approach to testing microprocessors, microprocessor support chips, read-only memory (ROM), random-access memories (RAM) and other semiconductor devices, the MX-17 is said to provide testing in a "conditioned natural environment."

OEM Products

The logic sequence through which the device under test is exercised is written in the language of the microprocessor itself.

The MX-17 also gives the user fully programmable control over all test variables, including logic levels, bias voltages, timing edge placement and formatting of data, addresses and clocks, the company said.

Priced at $3,500, the MX-17 is scheduled for initial deliveries in the fourth quarter of 1977 from 11B North Ave., Burlington, Mass. 01803.

Mostek Memories Fit Nova 3, Larger Machines

Mostek Corp. was at the show with its MK8003 Nova 3 compatible memory card and MK8000 128K by 24-bit memory system.

The MK8003, which is said to be compatible with Data General Corp. Nova Models 3/4, 3/12 and 3/D, allows the user to place the maximum addressable memory for the Nova 3 series in only two card slots, freeing up additional slots for I/O, the firm said.

The MK8003 is built on a single 15-in. by 15-in. PC card and features an access time of 350 nsec maximum and cycle time of 700 nsec maximum, the firm claimed.

Operating modes include read, write, read/modify/write and refresh. Capacity is 128K-, 64K-, 32K- or 16K words by 17 bits.

Delivery is 45 to 60 days for the MK8003, which is priced at $8,250 in single quantities. OEM discounts are available.

The MK8000 series was designed to provide the OEM with a single memory card that can be used in a variety of applications — including 16K by 18 small processor storage and 1M-byte large computer main memory and mass rotating media replacement, Mostek said.

Access time is 250 nsec and cycle time is 450 nsec, according to the firm. The MK8000 is $7,560 in single quantities and OEM discounts are available from the firm at 1215 W. Crosby Road, Carrollton, Texas 75006.

Readers/Transmitters Shown by Admaster

Admaster Corp. introduced three configurations of the Model 612 stand-alone paper tape reader/-transmitter.

The Model 612 features up to 150 char./sec sychronous or asynchronous parallel transmission rate or 50- to 9,600 bit/sec serial transmission rate, internally switch-selectable.

The 612-1 parallel TTL level configuration costs $625; the 612-2 EIA RS-232C serial and TTL parallel $725; and the 612-3 current loop serial and TTL parallel $725 in quantity one. Deliveries are scheduled to begin in late October from 416 Junipero Serro Drive, San Gabriel, Calif. 91776.

Home DP Mart Seen Flourishing

(Continued from Page 49)

from $6,000 to $20,000.

The hobby market, which has only been around for about two years, is comprised primarily of kit products directed at the electronic experimenter/hobbyist. These CPU kits retail from $700 to $900. Peripherals, however, can raise the cost of the finished product to a $2,000 investment by the user.

While professional and hobby computer markets are estimated at $105 million and $38 million respectively for 1976, they will soon be outdistanced by the home or consumer computer market, which by 1982 is expected to account for 55% of personal computer sales and show the highest growth rate, he stated.

In 1978, the professional computer market will reach $140 million, Wickham estimated, while hobby computers will hit $120 million and consumer computers $100 million. By 1980, however, the picture will have changed, with the markets estimated at $200 million for professionals, $187 million for hobbyists and $385 million for consumers, he said.

Projected further out, the consumer computer is expected to be a $1.25-billion market opportunity in 1985, he remarked.

A key ingredient in the growth of the home computer market is the availability of maintenance services and support activities to extend the usefulness of the systems, Wickham pointed out.

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Department Backs S. 825

Commerce Claims Voluntary Standards Unfair

WASHINGTON, D.C. — The current voluntary standards procedures, frequently marked by a lack of due process, often discriminate against small business and the consumer, according to a report prepared by the U.S. Department of Commerce and presented to the Office of Management and Budget (OMB).

Those currently involved in setting standards are those who can afford the time and funds to participate in the decision-making process; many who are affected by the particular standard being created are therefore often excluded from the process, according to the report.

The report, "Voluntary Standards and Testing Laboratory Accreditation," backed the pending legislation S. 825 that would create an independent government-financed standards board and an Institute of Standards and Accreditation in the National Bureau of Standards [CW, July 11]. S. 825 is called the Voluntary Standards and Accreditation Act of 1977.

The Commerce study examined four alternative ways of ensuring that minimum due process safeguards are incorporated in all private standards development organizations, testing laboratories and certification agencies.

In addressing the issue of National Standardization, the report recommended supporting S. 825 over the other three alternatives — OMB directives, establishment of a voluntary cooperative program by the Department of Commerce and regulations promulgated by the Federal Trade Commission (FTC).

Title I of S. 825 provides for the development of a uniform national standardization process for standards and certification activities undertaken by the private sector.

The legislation would empower the FTC to make procedural rules for standards development, product testing and certification.

It also would provide for enforcement by the FTC and judicial review of those FTC rules orders and decisions made pursuant to Title I, the study said.

Among the alternative methods of promoting national standardization was the OMB directive scheme. This would permit federal agencies to limit their participation in private standard development activities to those with minimum due process safeguards.

Agencies adopting such standards would not "unduly inhibit competition, restrict technological innovation or disadvantage small business or consumers," according to the report.

The second alternative, a cooperative Department of Commerce program, would empower the Secretary of Commerce to accredit private standards development organizations and product certification agencies that voluntarily included the due process safeguards in their procedures.

The third alternative was that the FTC would require such minimum due process safeguards.

Executive Order

For international standards the report recommended not S. 825 but an executive order, which would empower the secretary of commerce to promote U.S. participation and representation in international voluntary standardization activities and work with private and public bodies to achieve a coordinated effort.

Furthermore, the executive order would provide presidential authority for the Interagency Committee on Standards Policy which was recently reestablished, the report stated.

Regarding accreditation of testing laboratories, the report also endorsed executive branch action under which the OMB could require agencies to use the Commerce's National Voluntary laboratory accreditation program.

The fourth section of the report focused on the need for a national policy on standardization and recommended that a Presidential commission undertake a study of the alternatives and their effects on the current functions being supplied by the private sector. The report recommended opposition of Title IV of S. 825.

The study, which would determine the parameters of a national policy on standardization, should consider the following alternatives, according to the report:

- Provision of a federal charter for the American National Standards Institute (Ansi).
- Establishment of a National Standards Council.
- Establishment of a National Standards Management Board as proposed in Title IV of S. 825.
- Establishment of a "quasi-public corporation" for standardization as proposed by the Subcouncil on Product Safety of the National Business Council for Consumer Affairs.
- Promulgation of an executive order which should "establish a national standardization policy under voluntary framework for implementation between the federal government and the private sector."

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UK's DP Sales to Grow 11.5%/Year: Commerce

International News

WASHINGTON, D.C. — Sales of computer and peripheral equipment in the UK are expected to grow at an average annual rate of 11.5% through the remainder of the decade to reach a level of $1.2 billion in 1980, according to U.S. Department of Commerce figures.

The intensified use of DP equipment is expected to result from more attractive computer prices and profit margin erosion under the combined pressures of inflation and recession.

"While the UK is an important EDP equipment producer nation, it is expected to remain a major importer of this equipment, as most local production is shipped to foreign markets. U.S. suppliers, whose equipment has traditionally found a highly favorable market among British end users, are expected to continue as market leaders, supplying 63% of imported computers and peripherals in 1980," Commerce stated.

By industry sector, sales to manufacturing are expected to grow 5% annually, banking 16%, retailing and utilities 13%, service bureaus 12% and both government and transportation 11%, according to Commerce estimates.

Despite its low growth rate, manufacturing will remain the single most important group in terms of DP investments, with expenditures on computers and peripherals of $266 million projected for 1980.

Sales to Government

The British government is second in terms of sales, representing expenditures of $93 million in 1974, which are expected to grow to $176 million in 1980.

"The central government is a significant force in the market because of its extensive programs involving research and development of computer applications and its strong participation in EDP policymaking within other user sectors, e.g., within the universities and the nationalized industries (British Rail, the National Coal Board, the Post Office)," Commerce noted.

The populations of medium- and large-scale computers are forecast to grow at an average annual rate of about 5% and 3%, respectively, from 1974 through the end of the decade.

On the other hand, significant price reductions are projected to encourage more than a doubling of small computer installations and a tripling of the minicomputer population between 1974 and 1980.

Direct Purchasing

British users favor multisource and direct purchasing practices, Commerce stated. "British customers, especially in the government and financial sectors where they expect to keep equipment for its full lifespan, have traditionally preferred to purchase computers and related equipment outright," it said, noting over 50% of the acquisitions in 1974 were purchased directly.

Commerce added that the use of mixed systems is becoming increasingly common. It observed that "Britain's giant computer producer, International Computer Ltd. (ICL), has traditionally taken a strong line against CPU linkage with any equipment not produced by the parent company or its subsidiaries.

"However, as the firm produces increasingly sophisticated equipment, with multipurpose functions, trade sources anticipate ICL will relax its policy."

U.S. Dominates

Directly and through their UK and European affiliates, U.S. manufacturers dominate the British market for computer and peripheral equipment, Commerce remarked. As of the beginning of 1975, U.S.-owned companies had supplied 67%, by value, of the installed computer base.

That same year, 65% of total imported DP equipment — including 92% of minicomputers; 62% of small/medium/large computer systems and 53% of peripherals — was purchased directly from the U.S., it estimated.

Sales of U.S.-made equipment are forecast to climb an average 9% annually between 1975 and 1980, rising from $415 million to $635 million, it added.

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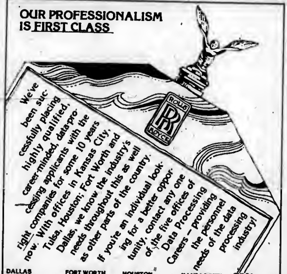

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Personnel Services
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In Austin, Texas

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Experienced digital hardware and software technical writers are needed to join in the development of TI's rapidly growing minicomputer business. Electrical Engineers and computer programmers with good writing skills should also apply.

Send resume in complete confidence to: **Lee Cooke, Staffing Manager/P. O. Box 2909, M.S. 2106/Austin, TX 78769.**

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PROGRAMMER ANALYST
Who Want Challenge and Location

You are the person we are looking for, if you want diversification (financial, engineering, manufacturing and business) and a true professional challenge (working on the leading edge of the state-of-the-art) in the beautiful surroundings of New Hampshire. You will be using a 370/158 OS/VS with IMS, TSO and will need good communications skills and expertise in COBOL, PL/1, BAL, FORTRAN, etc.

We need Programmer Analysts with 2-4 years IMS (batch and on-line) experience in the following areas:

- manufacturing systems (using IMS, BMP, CSMS, etc.)
- financial systems
- industrial relations/payroll

A degree in Computer or Hard Science or BS/BA is required with an MS or MBA preferred.

Call (603) 885-2881 or send your resume in complete confidence to Mr. A.O. Whitworth, Sanders Associates, Inc., D.W. Highway South, Nashua, N.H. 03061.

Sanders Associates is an equal employment opportunity and an affirmative action employer.

SA
SANDERS ASSOCIATES, INC.

MANAGER, UTILITIES

Crown American Corporation, owner/developer of Regional Shopping Centers has an opening in the Utilities Division for a Manager to plan, coordinate and analyze present and planned utility distribution systems.

The successful candidate will be familiar with utility rate schedules and tariff policies. In addition, familiarity with energy conservation systems is helpful, as well as digital computer hardware, system software, data acquisition equipment, man/machine interface techniques, and APL programming language.

Please send detailed reses including salary history in confidence to:

Manager, Personnel
CROWN MEDICAL CORP.
131 Market Street
Johnstown, PA 15907
An Equal Opportunity Employer M/F

SYSTEMS ANALYST

Large mfg co needs expertise in order entry, sales forecasting, sales analysis + marketing systems. COBOL bkrnd a strong plus. BS. $19,000 (Fee Paid) . . Contact P. Siegel.

ROBERT HALF
PERSONNEL AGENCIES
1310 Liberty Bank Bldg
Buffalo, N.Y. 14202 m/f
(716) 842-0801

PROGRAMMER ANALYSTS

Analysts International Corporation is a leader in the rapidly expanding software services industry specializing in the analysis, design, programming and implementation of systems for industry and government across the nation.

Our Detroit and Philadelphia branches are seeking individuals with a minimum of 3 years experience in either COBOL or PL/I. Knowledge of FORTRAN, ALC, IMS, DMS, TOTAL or CICS is a plus.

We can offer an excellent salary and benefit program including fully paid medical insurance.

Director of Personnel
ANALYSTS INTERNATIONAL CORPORATION
3000 Town Center, Suite 1030
Southfield, Michigan 48075
(313) 353-7230
An Equal Opportunity Employer M/F

AiC

OPENINGS EXIST FOR FOLLOWING

SYSTEMS PROGRAMMERS IMS/VS. DEC MVS. SVS and CPE S/M	$25K
SR. ANALYSTS BOMP Analyst Financial. Property and Corp Systems.	to $25K
INS ANALYSTS CFO Life Analyst. CYBENTEC. SAL Life Analyst	to $22K
BANKING ANALYSTS MICN CPCS. CD Project Mgr., Trust Analyst many openings.	to $22K
HONEYWELL ANALYSTS BECOS Systems GMAP H6000. IDMS or IMS or IDS	to $25K
DEC ANALYSTS Internals. Diagnostics. Real Time. Mfg Applications.	to $22K

EDP SEARCH AND EXECUTIVE PLACEMENT
2401 SW 39th. Suite 200. Oklahoma City. OK 73112
405-525-0633

EDP Professionals

- **Internat Consultants (2)** **$33,000**
Major NY Bank seeks 2 Senior Systems Analysts with excellent OS/VS applications' systems development exp. Strong project management & interpersonal skills. On-line systems exp required.

- **Mgr Business Sys Analysis** **$38,000**
Multi division Financial Services Firm has position open for systems development pro with excellent analytical & conceptual skills to head up systems planning effort. MBA required (prefer finance). Very visible, growth-oriented position.

- **Mgmt Consultants** **$25-40's**
MAS Division of CPA firm presently recruiting for candidates with heavy experience in one of the following: large scale T/P systems, Data Base systems design, hardware & software performance measurement.

- **Director-Data Base** **$38,500**
NY based Financial Firm with multiple data centers seeks individual with min 5 years data base design experience to head up company-wide data base effort. Candidate must have excellent IMS, DB-DC & 2 yrs management experience.

- **Project Leader** **$26,000**
NY Bank has position open for Senior Prog Analyst to take charge of systems effort presently in the development stage. Individual must have solid systems design experience & excellent OS/VS COBOL Prog bkgd-official position. 4 Weeks Vacation.

For Information on these & other career positions, please call or send letter/resume in confidence to:

DAN JARVIS
the jarvis walker group
535-5th Ave, NYC 10017 (212) 557-2850

CAREER OPPORTUNITIES . . . for ambitious, career-minded individuals with a rapidly growing property and casualty company owned by the third largest life insurance company in the world.

INSURANCE APPLICATION PROGRAMMER/ANALYSTS

You will be working with modern equipment and the latest systems in developing and expanding property and casualty automated insurance systems, both personal and commercial lines, using COBOL in an IBM 370/OS/VS/IMS environment. ACT NOW!!

Send resume or call Personnel
Toll free. 1-800-433-1560.
If in Texas, call 1-800-792-1060

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GENERAL INSURANCE COMPANY

6100 Bridges Place
Fort Worth, Texas
76131
(817) 731-4181

AN EQUAL OPPORTUNITY EMPLOYER M/F

Data Processing
Assistant Director
Information Processing
City Colleges of Chicago

Assistant Director will be responsible for coordinating, implementing, and maintaining information system and procedure projects for the Chicago Urban Skills Institute.

Minimum of five years' experience in data processing with at least two years designing large information systems. Experience with mini-computers, data base and on-line systems a plus. Bachelors degree or equivalent background required.

Excellent fringe benefits. Salary commensurate with experience. Send resume in confidence to:

Dir. of Information Processing
City Colleges of Chicago
180 North Michigan Ave.
12th Floor
Chicago, IL 60601
EOE/AAE

CSC

COMPUTER
SYSTEMS PROGRAMMER/ANALYSTS

TECHNICAL SUPPORT ANALYST

The Information Network (INFONET) Division of Computer Sciences Corporation has an immediate requirement for a proven professional to provide systems and customer support on an operational remote computing network at our Washington, D.C. Center.

The selected individual will have at least 4 years experience in Assemble language and FORTRAN, a system or timesharing background, and experience on UNIVAC 1108 is desirable. Degree in Computer Science a plus.

CSC offers an excellent salary and a full range of company paid benefits.

For immediate consideration, please call or write:

Mr. Angelo Gravagna
(301) 937-0500
MKSAC DP-1
Infonet Division
11700 Infonet Drive
Beltsville, MD 20705

Major Offices And Facilities Throughout The World
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Sr. Engineer Electronics
(Sys. Programmer)

BS Engineering, Physics or Math - 6-10 years exp. in computer program development, assembly or higher level languages. Experience in training simulators and/or electronic warfare.

Salary to $25,000

ROBERT HALF
PERSONNEL AGENCIES
7733 Forsyth
Suite 380
St. Louis, Mo. 63105

FACULTY POSITION
IN COMPUTER SCIENCE

available beginning in January, 1978. Faculty rank; salary; DOE/QUALS. Duties include undergraduate instruction in systems programming, computer architecture and business systems analysis as well as curriculum development. Minimum educational requirement is a Master's degree in Computer Science. Industrial experience preferred. Please send resume (including references) by November 15, 1977 to: Robert S. Shaak, Chairperson, Department of Mathematics and Computer Science, Millersville State College, Millersville, PA 17551. Millersville State College is an Equal Opportunity/Affirmative Action Employer.

SYSTEMS AND PROGRAMMING SUPERVISOR

Challenging opportunity to utilize your professional and managerial ability to a top Fortune 40 Company at one of it's manufacturing facilities located in Central Ohio.

Previous supervisory experience required coupled with demonstrated managerial capabilities in manufacturing and financial systems. Degree preferred. Equipment consists of IBM 360/30 and 370/168.

Excellent growth potential, salary in the 21-23K range, superior fringe benefit program. Interested applicants should forward their resumes with current salary in confidence to:

CW Box 3183
797 Washington St.
Newton, Mass. 02160
An Equal Opportunity Employer M/F

Software Professionals...

Digital's Educational Services Group was the answer for Judy...

and it could be the answer for you.

If you're looking for a place where you can combine your technical expertise and interpersonal communications skills — a place that is both receptive and rewarding — consider Judy's experience.

Judy wanted the opportunity to utilize the full range of her abilities. And she found it within Digital's Educational Services Group.

We offered her an environment that encourages initiative, increased responsibility, and professional advancement while providing the opportunity to work at the vanguard of computer technology. Judy came to Digital as an Instructor, has been promoted every year, and is now a Manager for Software Course Development with one of the largest training organizations in the computer industry. Her primary responsibility is for the definition and development of all training for new products, both present and future, but as Judy says, "you always have the opportunity to take on new responsibilities and to explore new areas."

Digital's Educational Services Group was the answer for Judy . . . and it could be the answer for you!

digital

Course Developers

We currently need individuals to determine and develop a broad range of advanced software instructional course material required for the support of both current and future products.

You'll be involved in state-of-the-art projects in the early stages, working directly with Engineering on product development and then writing the preliminary objectives, outlines, and tests necessary to instruct others about these products. You'll provide all technical information to the individuals — finalizing their instructional courses, conducting seminars, and aiding in the certification of instructors. In addition, you'll be responsible for reviewing and evaluating the technical content of all documents pertinent to the projects.

If you have a background in Systems Analysis, Systems Programming, Operating Systems Support, Data Base Management, or Software Course Development and Teaching, we would like you to consider this unique opportunity to broaden your technical background while communicating your expertise.

You'll be involved in the following areas of technology:

- Data Base Management
- Data Communications
- Commercial Applications
- Computer Networks
- Operating Systems
  (DOS, IAS, RSTS, RSX-11, RSX-20F, RT-11, TOPS-10, TOPS-20)
- Programming Languages
  (ALGOL, APL, ASSEMBLY, BASIC, BLISS, COBOL, DIBOL, FOCAL, FORTRAN, RPG)

We're located in Digital's Corporate Headquarters in Maynard, Massachusetts, a residential community approximately 25 miles west of Boston. A few of these positions will be relocating to New Hampshire. Additional positions are available for Software Instructors.

Please forward your resume including salary history and requirements to Mary Ann Joyce, Digital Equipment Corporation, Dept K103, 162 Main Street, Maynard, Massachusetts 01754. We are an equal opportunity employer m/f.

We're the company looking for people.

DATA PROCESSING CAREER WEEKEND

PROGRAMMERS
PROGRAMMER ANALYSTS —
SYSTEMS ANALYSTS
Hardware • Software

BOSTON

If you are a Programmer; Programmer/Analyst, or Systems Analyst, you now have the opportunity to meet with as many as 20 nationally known "Blue Chip" companies one at a time. Weeks of searching accomplished on one weekend without taking any time off from your present position. There are no fees of any kind. To arrange interviews send your resume with present salary to: **SEARCH E.D.P., INC.**

SUITE 25, 3181 LINWOOD AVE.
CINCINNATI, OHIO 45208

EDP OPPORTUNITIES

This is a capsule list of the many positions we represent nationwide, many in the Southeast.

All fees paid by employer

Programmers	$12 to 17K
Prog/Anal.	$12 to 19K
Prog/Anal - CICS	$16 to 19K
Prog/Anal - DB	$13 to 20K
Sys. Anal.	$14 to 21K
Sys. Prog.	to $22K
Proj. Lead.	to $23K
Sr. EDP Auditor	to $23K
Sr. Sys. Anal.	$17 to 23K
Mini Anal.	to $25K
On-Line Anal.	to $25K

Current employment will be protect. Send resumes including salary and location preference to:

Jim Staal, Manager, Information Systems Division or Frank Parks, Banking/Insurance EDP Consultant

Whitlow & Associates
3390 Peachtree Road, N.E.
Suite 438
Atlanta, Ga. 30326
Telephone (404) 262-2566

PRODUCT LINE SALES MANAGER

Continental Peripherals has immediate need for a Product Line Sales Manager experienced in memories, disk drives and printers. This is an outstanding opportunity with a listed company, multimillion sales, national/international operation.

The person we are seeking will have a proven record of accomplishment in technical sales management.

For a confidential interview call or send your resume including salary history to: Judy La Brie, **CONTINENTAL PERIPHERALS**, 175 Middlesex Turnpike, Bedford, MA 01730 (617) 275-0850.

CP Continental Peripherals
A DIVISION OF CONTINENTAL RESOURCES, INC.

Software Specialists, use our Mini-resume for quick response to your career goals.

Mini-Resume
Digital Equipment Corporation

Name________________________
Address________________________
City____________ State____________ Zip______

Position Desired (check one)

☐ Field Software Support ☐ Home Office Software Support ☐ Software Development

Describe your present position: from:________ to: ________

What's your educational background: ________________________

Phone Number____________ ____________
Home Business

With several challenging openings throughout the United States, Digital Equipment Corporation offers the experienced Software Specialist a truly outstanding opportunity to join the world's leading manufacturer of minicomputers.

Today, just 20 years after we opened our doors, we've grown to more than $1 billion in sales.

If this is the kind of growth environment that interests you, then you interest us.

The people we're looking for have experience with Digital equipment, using RSTS/E, RSX 11, IAS or similar software tools. Our current openings exist for individuals with the following background:

- Real-time event driven interrupt applications
- Timesharing business applications development
- Program conversion techniques

USE OUR MINI-RESUME FOR QUICK RESPONSE.

Fill out the mini-resume above and mail it to: George Peterman, Dept. H103 3807, 129 Parker Street, Maynard, Massachusetts 01754. We are an equal opportunity employer, m/f.

We're the company looking for people.

digital

DATA PROCESSING PROFESSIONALS

Due to recent internal expansion, Lennox Industries Inc., a nationally recognized leader in the heating and air conditioning field, has positions available for Systems Analysts, Senior Applications Programmers and Applications Programmers.

Processing environment is a 370/158 under OS/VS1 providing real time and batch teleprocessing services for many locations throughout the United States and Canada.

These positions offer a competitive compensation and benefit package and excellent opportunity for growth.

Please submit a resume which includes salary history to:

John Dugan
Lennox Industries Inc.
200 S. 12th Avenue
Marshalltown, Iowa 50158
An Equal Opportunity Employer

DEC Systems Programmer

Come to the land of opportunity!

FORDHAM UNIVERSITY is looking for DECsystem 10-20 systems programmers. This is a fine opportunity for someone with an academic bent who is looking for a challenging position.

For more details contact
Mr. Joseph Middleton
Mgr. of Academic Services
Computing Center
Fordham University
Bronx, N.Y.
(212) 933-2233

IBM

We're a specialized recruiting firm offering national coverage. Our clients are fortune 500 companies + smaller regional firms. Our Company Clients pay our fees plus interview, relocation and temporary living expenses. Of 182 firms like ours, we came in 2nd in the U.S. in 1976 in terms of placements and production. If you're even thinking about looking for a better position you can't afford not to let us help. Here's a sample of current openings.

Sys Prog Supr-IMS/VS	to $30K
Data Comm Spl-COMTEN	to $30K
Sys Prog IMS-JES III TSO	to $29K
Prog/Anal IMS/VS COBOL	$24K
DB Anal PSB DBD MFS	$24K
Proj Ldr-Pers Trust OS	$22K
Prog/Anal OS/Cobol	$20K
Prog/Anal OS/PL-1	$20K
Prog/Anal OS/ALC	$20K
Sys Prog DOS/VS/CICS	$20K
Prog OS/DOS ALC	$14-19K
Prog OS/DOS Cobol	$14-19K
Prog OS/DOS PL-1	$14-19K

Call Toll Free 24 Hrs./Day
1(800) 821-2270 X605
In Mo. Call 1 (800) 992-7958 or send resume to:

438 Gulf Life Tower
Jacksonville, Fla. 32207

Ask for our new free booklet on effective resume preparation

Bill Denny
JIM KING

At Marlboro, We Think Large...

Digital in Marlboro, Massachusetts is the home of our Large Computer Group (DECsystem 10, DECSYSTEM 20).

We emphasize individual commitment and accomplishment. Here, dedicated professionals have the autonomy to explore the boundaries of computer development, with support readily given to their projects and recognition given to their achievements. If you are seeking a highly professional environment that truly encourages independent creativity, its waiting for you at Digital in Marlboro.

Operating Systems

Supervisor-Software Development

A position of high visibility exists for a truly creative individual to supervise a project team in the development of a highly advanced Batch system designed to interface with Digital's DECsystem 10 and DECSYSTEM 20.

The qualified candidate will have a BS degree in a technical discipline or equivalent with two or more years of supervisory experience. Software development experience of large scale systems is necessary.

Senior Software Engineers

If you enjoy working in a group of highly professional and motivated individuals, you will be interested in the opportunities that exist in our TOPS-20 monitor group to development enhancements to a large scale, state-of-the-art, timesharing system.

If you have 3-5 years experience in assembly language programming on large systems, this could be the chance you've been waiting for to utilize your skills in a challenging environment. A BS degree in Computer Science or equivalent is preferred.

Language Products

Senior Software Engineers

If your working vocabulary includes languages such as APL, MACRO-10 or BLISS, plus compiler development experience, and you're tired of bit pushing in assembly code, we have exciting opportunities for you.

We're looking for people to join an expanding development team producing language processors for Digital's mainframe computers. BLISS and interactive development tools are being used to produce high quality sophisticated and timely language products for the system which is the industry's leader in timesharing.

You'll need 2-5 years experience designing and implementing compilers and language I/0 systems. A degree in Computer Science or the equivalent, plus project leadership experience is preferred. Opportunities also exist in our Commercial Software group to work on a data base management system for the DECsystem 10 and DECSYSTEM 20. The successful candidate will have knowledge of DBMS applications and assembly language systems programming. A BS degree or equivalent is preferred.

Computer Services

Senior Software Support Specialist

We currently have career opportunities for "hands-on" doers who are performance oriented to provide technical support for our in-house marketing and development data centers. Responsibilities include developing simulator software for our DECsystem 10's and DECSYSTEM 20's and network and communications support for these systems.

The successful candidates will have 3-5 years experience in assembly language programming and in System or Software support. A BS degree in Computer Science or equivalent is desirable.

The challenge and opportunities you've been looking for are waiting for you at Digital in Marlboro. Please forward your resume including salary requirements and indicating area of interest to Carol A. Reed, Digital Equipment Corporation, 200 Forest Street, Marlboro, Massachusetts 01752. We are an equal opportunity employer m/f.

We're the company looking for people.

digital

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come GROW with us

Continuing growth of our Group demands the addition of two more people to our Data Processing staff. If you have the following qualities - YOU may be the person we need !

Programmer Analyst:
With three years of broad property-casualty experience to analyze a variety of areas. A COBOL, DOS/VS background helpful.

Senior Programmer:
Need three years experience in life insurance systems design and installation. Package installation skills helpful. Applicant should have strong programming, user liaison, and analysis skills, and a BAL orientation on IBM equipment.

We offer competitive salaries and a modern benefits package.

Write or call:
Michael Elliott
NGM Group
55 West Street
Keene, New Hampshire 03431
(603) 352-4000

the NGM Group
National Grange Mutual Insurance Co.
NGM Fire and Casualty Insurance Co.
Maine Fidelity Life Insurance Co.

DATA BASE MANAGER

Oakland Unified
School District
Salary:
$1,817-$2,063 per month

Any combination equivalent to graduation from college in accounting, business, computer science, mathematics, statistics, industrial engineering, other related field; and four or more years of experience in systems analysis, design, programming and/or software analysis including two or more years of experience in the design, development, control, and management of data bases.

Excellent fringe benefits, including fully paid health, dental and life insurance plans. Excellent retirement plan.

Apply Oakland Unified School District, Office of Classified Personnel, 1025-2nd Avenue, Room 230, Oakland, CA 94606 (415) 836-2622, Ext. 556. Deadline for applying October 7, 1977

INSURANCE PROFESSIONALS

If you've thought about changing jobs and would like to know what's available, call or write Jack Edwards to discuss your options.

Jack's only specialty is insurance data processing. He is a FLMI and has held management and consulting positions in the insurance industry for 19 years.

Client companies currently have openings in programming, analysis, consulting and management. Salary ranges from $15,000-$28,000, and locations include New England, Middle Atlantic, Southeast and Midwest.

If you are currently working for a LIFE or CASUALTY company and are ready to move up, get in touch today. You've got everything to gain.

Jack Edwards Associates
Suite 600
8150 Leesburg Pike
Vienna, Virginia 22180
(703) 821-0688
Insurance Personnel

PROGRAMMERS AND ANALYSTS

Let us offer you our professional expertise in finding the "RIGHT" position and company.

Our individualized search will provide you with local or national exposure depending on your geographical preference.

If you have at least 2 years experience in programming send your updated resume, geographical preference and salary requirements in strictest confidence to:

SEARCH E.D.P., INC.

SEARCH E.D.P. INC.
13773 N. CENTRAL EXPRESSWAY
SUITE 1305
DALLAS, TEXAS 75243

SEARCH E.D.P. INC.
SUITE 25, 3181 LINWOOD AVE.
CINCINNATI, OHIO 45208

STANLEY

SUPERVISOR COMPUTER OPERATIONS

The Stanley Works Corporate Data Center has a requirement for a competent data processing professional to manage its computer operations. The succesful candidate will have a college degree and will be experienced in the direction of day-to-day operations of a large-scale computer, processing a complex mix of batch and teleprocessing applications. This position demands communicative and supervisory skills and has significant growth potential.

Send resume with salary history to:

THE STANLEY WORKS
Corporate Employment, Dept. 1007C
P.O. Box 1800, New Britain, Conn. 06050
Stanley Tool, Stanley Hardware, Stanley Steel.

An Equal Opportunity,
Affirmative Action Employer

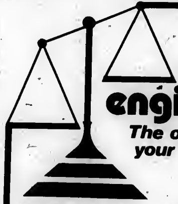
STANLEY

Field Engineering Specialists

Amdahl Corporation has earned an international reputation as builder of the most advanced large computer system. Since our first shipment two years ago, we have delivered a quarter of a billion dollars worth of computers to the world's major companies and institutions. The company is exciting, the environment stimulating, and our compensation and benefits are excellent.

We seek Field Engineering Specialists who have a minimum of 5 years' experience in maintaining large-scale systems with in-depth training on compatible CPUs. You will have company support in assisting the Amdahl customer in his mixed-vendor environment to maintain full operations in his center. You will have the opportunity to work with multiple customers, to guide and support field engineers and to use your technical expertise for your own personal development and the growth of the Amdahl Corporation. Openings exist at Amdahl headquarters in California and temporary assignments are available in the Far East with a permanent assignment following. Please indicate 580-E on your response and direct it to Employment Manager, Amdahl Corporation, 1250 East Arques Avenue, Sunnyvale, CA 94086. We are, of course, an equal opportunity employer.

amdahl



sales engineers

The odds are in your favor with Sperry Univac!

Mini's with advantage. The V-77 series of mini-computers; a fast, powerful trio that cover a broad spectrum of the marketplace, from scientific to data communications. They're a well structured family that offer a sales engineer with a need for success: Versatility, compatibility, price and performance. A mini-computer family you'll be proud to sell. In fact, we're so sure of the V-77's performance that we're dedicated to doubling our sales this year.

To accomplish this we need hard working, dedicated sales professionals with a minimum of 2 years mini-computer sales experience in the Data Base, Data Communications and/or Distributed Processing marketplace AND technical competence in hardware and software. In addition, you must have a record as a closer who maintains account relationships, one who gets new and repeat business.

What can you expect from us: For starters, one of the best incentive plans the industry has to offer, and second a real opportunity to develop your career, both for the short term and the long term. The odds really are in your favor with us.

For openings in Chicago, Dayton, Detroit, Philadelphia, New Jersey, New York (Manhattan), Atlanta, Orlando and Washington, D.C. please call Gerry Goerlitz collect at 215/542-5254 or send your resume to B301M, P.O. Box 500, Blue Bell, Pa. 19422.

For openings in Dallas, Houston, Los Angeles, San Francisco or Seattle, please call Gary Montgomery, collect at 714/833-2400 or send your resume to 2722 Michelson Drive, Irvine, Ca. 92713.

SPERRY UNIVAC
COMPUTER SYSTEMS

To investigate other openings with Sperry Univac, please direct your resume to
P.O. Box C19504, Irvine, Ca. 92713

Equal Opportunity Employer M/F

DATA PROCESSING POSITIONS in FLORIDA

The Computer Systems Division of Harris Corporation is a part of the fast growing Fort Lauderdale community. Our medium scale digital computers now rank among the nation's finest digital computer systems available on the marketplace today.

YOU can find your place in the sun in our divisional headquarters if you qualify for one of the opportunities listed below.

SENIOR SOFTWARE TECHNICAL WRITER

A challenging position for the qualified candidate who can research, write and edit reference and user software manuals; direct a small group of software writers; interface effectively with system software analysts and publications personnel. The successful candidate will have at least 2 years' experience in software technical writing, an English degree or computer science and a broad range of programming experience.

OPERATING SYSTEM and COMPILER SOFTWARE ANALYST

If you wish to work with state-of-the-art operating systems and compiler software, our Computer Systems Division is the place for you. A solid education and previous experience in operating systems or compiler design coupled with assembly language programming will qualify you as a candidate.

INSTRUCTORS

Hardware and software instructor positions are available for individuals with 3-5 years' experience in either hardcore course preparation and classroom instruction. Occasional travel is required. We seek candidates with a degree in computer science, math or other equivalents.

FIELD ANALYSTS

Several positions within the marketing organization are available. We expect applicants to possess a minimum of expertise in FORTRAN and COBOL, operating systems and sensitivity to customer problems.

FIELD SERVICE ENGINEERS

We prefer individuals with heavy exposure to pre and post installation problems. A thorough knowledge of electronics, especially CPU's, disc drives and other peripherals will be necessary for successful customer support.

HARRIS has several other growth oriented positions available in the field and at Fort Lauderdale. These positions are in the following disciplines:

DESIGN ENGINEERS
SOFTWARE DEVELOPMENT
TECHNICAL WRITERS
SALES PERSONNEL
PRODUCT SPECIALISTS
CONTRACTS ADMINISTRATORS
ACCOUNTING MANAGEMENT

If you are a data processing professional and feel that you would like to make a change with a fast growing Fortune 500 company such as Harris, we would appreciate you taking the time to complete and clip out the information requested below. This will be held in the strictest confidence

I am interested in the following areas:

___Software Development
___Manufacturing
___Quality Control
___Sales
___Engineering Design & Development
___Field Service Support
___Field Analyst Support
___Accounting & Administration
___Personnel

NAME ______________________________
ADDRESS ______________________________
CITY ______________ STATE ______________ ZIP ________

___ Enclosed is my personal resume for your convenience.

Attn: W.D. Taylor, Manager of Employment, Harris Corporation, Computer Systems Division, 1200 Gateway Drive, Fort Lauderdale, Florida 33309.

HARRIS
COMMUNICATIONS AND INFORMATION HANDLING

An Equal Opportunity Employer Male and Female

Data Processing

ANALYSTS/PROGRAMMERS BUSINESS SYSTEMS

Major retail organizetion in Northern Virginia continues to expend its data processing services and has opportunities in the development and support of business systems in the Financial, Operating and Marketing functions of a growing corporation with an excellent track record.

ANALYST/PROGRAMMER

Openings for senior personnel and personnel with 1-2 years experience in the design and implementation of financial, inventory control and payroll applications in an IBM DOS/VS environment using COBOL.

SYSTEM PROGRAMMER

Requires experience in an IBM 370 DOS/VS POWER communications environment. Must possess ability to grow and lead tha development of an expanding communications environment.

These are outstanding growth opportunities. Send resume including salary history in strict confidence to:

PEOPLES DRUG STORES, INC.
Attn: M.A. Wright, Employment Manager
6315 Bran Mar Drive, Alexandria, VA 22312
An Equal Opportunity Employer M/F

ATTENTION:

COMPUTER PROGRAMMERS/ SIMULATION ANALYSTS/ COMPUTER MAINTENANCE ENGINEERS

Lockheed Electronics Company Systems and Services Division at the Johnson Space Center in Houston, Texas, has career opportunities in suppport of NASA's Space Shuttle Program.

Facilities are located approximately 25 miles south of downtown Houston in the Galveston Bay area. Employees can live in attractive, modern suburb within 5 minutes of their work location with no state or city income taxes.

We are in need of ASSEMBLY LANGUAGE PROGRAMMERS, SOFTWARE MAINTENANCE ENGINEERS, COMPUTER MAINTENANCE ENGINEERS and SIMULATION DEVELOPMENT ENGINEERS.

Prefer applicants with a minimum of four years applicable experience and a degree in mathematics, physics, computer science, engineering or the equivalent.

Or send your resume in confidence to Mr. Bill Jancha, Dept. A-10-CW1, Lockheed Electronics Company, Inc., 16811 El Camino Real, Houston, Texas 77058.

LEC LOCKHEED
ELECTRONICS COMPANY, INC.

An Equal Opportunity Employer M/F

EXPANSION

Within the past year, more than 100 PROGRAMMERS and PROGRAMMER/ANALYSTS will be moving to one of the Midwest's most beautiful cities, a city of 450,000 people living in an unpolluted atmosphere with a moderate cost of living and the cultural advantages of a city twice it's size.

Our client, a large securities firm, is expanding their EDP staff and has immediate openings for PROGRAMMERS and PROGRAMMER/ANALYSTS. The successful individuals will have 1 to 5 years experience on large IBM systems operating OS, will be proficient in COBOL, and have exposure to IMS Data Base and DL/1. A degree and knowledge of financial or insurance applications will prove a great plus. Starting salaries range from $12-18,000.

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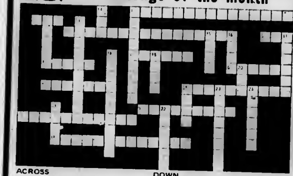

ACROSS

1. The snowball problem
2. The grim, grey giant
3. Data management software (2 correct answers)
4. Capability of making more than one mistake at a time
5. Physical storage cycle
6. Put in machine readable format
7. Common business oriented language
8. Message switching
9. Collection of cryptic, graphic symbols
10. Double-octal
11. Everyone advocates it, no one does it
25. Transformation

DOWN

1. Caller's argument
12. Dartmouth language
13. Funcational module
14. The increment by which programmers slowly go mad
15. List member
16. Programmer reaction when it runs right the first time
17. Device to keep bugs out
18. Sequence of instruction
19. Place where all garbage ends up
20. Started with cash registers
21. BPS
22. The opposite of batch
23. Non-constant
24. Table look up
25. Customer information control system

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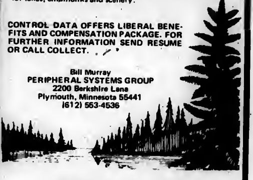

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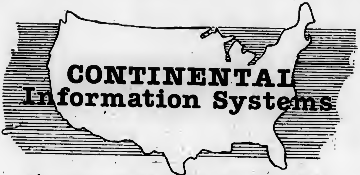

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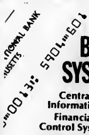

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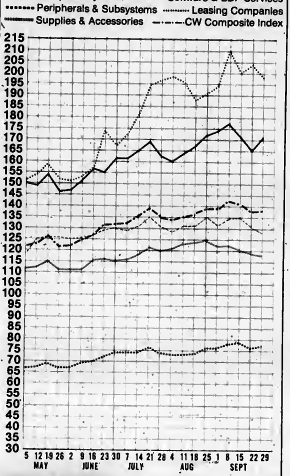

Earnings Reports

INTERSIL

Three Months Ended June 26

	1977	a 1976
Shr Ernd	$.29	$.91
Revenue	20,835,000	18,777,000
Earnings	1,986,000	50,000
9 Mo Shr	.77	.49
Revenue	60,853,000	52,284,000
Tax Cred	1,253,000	842,000
Earnings	4,144,000	2,065,000

a-Restated to reflect combined results of merger of Advanced Memory Systems in November 1976.

ITEL

Three Months Ended June 30

	1977	1976
Shr Ernd	$.55	$.40
Revenue	85,400,000	64,500,000
Earnings	5,700,900	3,400,000
6 Mo Shr	1.09	.73
Revenue	164,000,000	121,790,009
Earnings	11,300,999	6,200,900

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Three Months Ended June 39

	1077	1976
Shr Ernd	$.12	$.12
Revenue	1,819,900	1,396,000
Earnings	96,000	104,000
6 Mo Shr	.24	.16
Revenue	3,456,000	2,675,000
Earnings	181,000	169,000

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Year Ended June 39

	1977	1976
Shr Ernd	$2.22	$1.52
Revenue	929,285,000	694,307,900
Earnings	37,965,009	26,412,000
3 Mo Shr	.83	.59
Revenue	293,236,000	192,269,000
Earnings	13,896,000	9,869,009

a-Includes results of Royal Industries, Inc. since Jan. 1

INTEL

Three Months Ended June 30

	1977	1976
Shr Ernd	$.75	$.52
Revenue	a69,222,999	50,624,000
Earnings	7,963,000	5,604,000
6 Mo Shr	1.44	.99
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a-Includes approximately $900,000 in proceeds from business interruption insurance

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 28, 1977

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1977 RANGE (1)	CLOSE SEP 28 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	AMDAHL CORP	22- 44	44	+6	+15.7
N	BURROUGHS CORP	33- 91	68 3/4	+1 3/8	+2.0
O	COMPUTER AUTOMATION	16- 30	24 1/2	+1	+4.2
N	CONTROL DATA CORP	29- 26	19 3/8	+ 1/8	+0.6
O	CRAY RESEARCH INC	15- 29	23 3/4	+1 1/4	+5.1
N	DATA GENERAL CORP	33- 51	48 1/2	+2 1/4	+4.8
N	DATAPOINT CORP	18- 32	23 7/8	+ 3/8	+1.2
N	DIGITAL EQUIPMENT	37- 33	47 1/2	+2 3/8	+5.2
N	ELECTRONIC ASSOC.	2- 5	1 7/8	0	0.0
A	ELECTRONIC ENGINEER.	6- 11	10 1/2	- 1/2	-4.5
O	FOUR-PHASE SYSTEMS	13- 13	18 1/4	+1 3/8	+8.1
N	FOXBORO	42- 34	44 1/4	+ 1/4	+0.5
O	GENERAL AUTOMATION	6- 3	6 1/2	+ 3/8	+6.1
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	69- 87	78	+1 1/4	+1.6
N	HONEYWELL INC	44- 53	45 3/8	+ 7/8	+1.3
N	IBM	245-286	239 1/2	+3 1/4	+1.2
O	MANAGEMENT ASSIST	5- 3	8	+ 1/2	+4.6
O	MEMOREX	23- 34	39 7/8	+ 3/8	+1.2
O	MICRODATA CORP	7- 18	12 1/4	+ 1/2	+4.2
O	MODULAR COMPUTER SYS	3- 8	6 3/4	+ 5/8	+10.2
N	NCR	32- 47	46 1/2	+2 3/8	+5.3
O	PRIME COMPUTER INC	12- 23	20 3/4	+3	+16.9
N	PERKIN-ELMER	17- 22	20	+ 1/2	+2.5
N	RAYTHEON CO	16- 33	29 3/4	0	0.0
N	SPERRY RAND	33- 92	33 1/2	0	0.0
O	SYCOR INC	6- 15	11 7/8	- 3/8	-3.0
A	SYSTEMS ENG. LABS	5- 8	6 7/8	+ 1/4	+3.7
A	WANG LABS.	10- 14	12 1/8	- 1/4	-2.0

LEASING COMPANIES

EXCH		1977 RANGE (1)	CLOSE SEP 28 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALANTHUS CORP	3- 5	4 7/8	- 1/8	-2.5
O	BOOTHE COURIER CORP	8- 10	10	- 1/4	-2.4
O	COMDISCO INC	10- 13	12 1/4	- 1/2	-3.3
A	COMMERCE GROUP CORP	1- 3	1 1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	1 1/8	0	0.0
M	DATRONIC RENTAL	0- 2	1 1/8	0	0.0
A	DCL INC	1- 2	1 7/8	- 1/8	-6.2
N	DPF INC	6- 3	3 1/8	+ 1/8	+1.3
N	ITEL	13- 22	21	+1 1/8	+5.6
N	LEASCO CORP	19- 27	23 3/8	+ 3/4	+3.3
O	LEASPAC CORP	1- 2	1 1/4	- 1/2	-28.5
O	NRG INC	1- 1	1/8	0	0.0
A	PIONEER TEX CORP	5- 11	5 3/8	0	0.0
N	U.S. LEASING	10- 15	12 3/4	- 3/8	-2.8

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1977 RANGE (1)	CLOSE SEP 28 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	5/8	- 1/4	-28.5
O	ANACOMP INC	7- 10	8 1/4	0	0.0
A	APPLIED DATA RES.	5- 10	7 1/2	+ 1/8	+1.6
N	AUTOMATIC DATA PROC	23- 50	26 1/8	+ 7/8	+3.4
O	COLEMAN AMERICAN COS	2- 2	2 1/8	0	0.0
O	COMPU-SERV NETWORK	10- 13	11 1/2	-1	-8.0
O	COMP ELECTION SYSTMS	6- 10	3	0	0.0
O	COMPUTER HORIZONS	1- 1	1 1/4	0	0.0
O	COMPUTER NETWORK	6- 11	10 1/2	+ 3/4	+7.6
N	COMPUTER SCIENCES	7- 9	8 1/4	+ 1/4	+3.1
O	COMPUTER TASK GROUP	1- 2	2	0	0.0
O	COMPUTER USAGE	1- 3	1 1/4	- 1/8	-9.0
O	COMSHARE	5- 8	7	- 1/4	-3.4
O	DATA DIMENSIONS INC	3- 3	3 1/8	- 1/4	-7.4
O	DATATAB	1- 2	1 1/2	0	0.0
N	ELECTRONIC DATA SYS.	16- 20	15 1/2	-1 1/2	-8.8
O	INSYTE CORP	2- 3	1 3/4	+ 1/8	+7.4
O	IPS COMPUTER MARKET.	1- 2	1 5/8	0	0.0
O	KEANE ASSOCIATES	3- 4	3 7/8	- 1/8	-3.1
O	KEYDATA CORP	2- 3	1 3/4	- 1/4	-12.3
A	LOGICON	7- 17	11 1/8	-1 1/8	-3.1
A	MANAGEMENT DATA	1- 2	1 3/4	+ 1/4	+16.6
A	NATIONAL CSS INC	19- 26	25 1/8	+1 1/8	+4.6
O	NATIONAL DATA CORP	4- 7	4 7/8	+ 3/8	+3.7
A	ON LINE SYSTEMS INC	16- 22	16 3/8	+ 1/8	+0.7
N	PLANNING RESEARCH	3- 6	4 7/8	- 1/8	-2.5
O	PROGRAMMING & SYS	1- 1	1/4	0	0.0
O	RAPIDATA INC	2- 3	2 3/8	- 1/8	-5.0
O	REYNOLDS & REYNOLD	17- 20	18 3/4	0	0.0
O	SCIENTIFIC COMPUTERS	1- 4	3 7/8	- 3/8	-13.8
O	TYMSHARE INC	14- 23	18 1/2	-1 1/2	-7.3
A	URS SYSTEMS	4- 5	4	- 1/4	-3.8
N	WYLY CORP	1- 2	3/4	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1977 RANGE (1)	CLOSE SEP 28 1977	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	10- 15	13 1/2	- 1/8	-0.9
O	ADVANCED MEMORY SYS	7- 9	6 7/8	- 1/4	-3.5
N	AMPEX CORP	8- 11	10	0	0.0
O	ANDERSON JACOBSON	3- 3	3 3/8	- 1/8	-3.3
N	APPLIED DIG DATA SYS	10- 20	13 1/2	- 3/4	-5.2
O	BEEHIVE INT'L	6- 12	3 1/2	0	0.0
O	BOLT.BERANEK & NEW	7- 9	8 5/8	- 1/8	-1.4
N	BUNKER-RAMO	6- 12	10 3/8	- 3/8	-3.4
A	CALCOMP	3- 5	3	- 1/8	-4.0
O	CAMBRIDGE MEMORIES	1- 4	3 1/4	- 3/8	-16.1
N	CENTRONICS DATA COMP	22- 30	27 1/4	- 1/2	-1.8
O	COGNITRONICS	1- 1	3/8	0	0.0
O	COMPUTER COMMUN.	5- 8	7	+ 1/8	+1.8
O	COMPUTER CONSOLES	4- 7	4	- 1/4	-5.8
A	COMPUTER EQUIPMENT	2- 3	3 1/8	+ 1/8	+4.1
O	COMPUTER TRANSCEIVER	1- 1	1 3/8	0	0.0
O	CONTEN	9- 13	10 1/2	+ 3/8	+3.7
N	CONRAC CORP	19- 28	21	- 1/2	-2.3
O	DATA ACCESS SYSTEMS	4- 3	5 5/4	0	0.0
O	DATA 100	6- 9	7 1/8	- 1/2	-6.5
A	DATA PRODUCTS CORP	9- 16	14 7/8	+ 3/8	+2.3
O	DATA TECHNOLOGY	3- 4	4	- 1/4	-5.8
O	DATUM INC	1- 2	2 1/8	0	0.0
O	DECISION DATA COMPUT	2- 5	2 1/8	- 1/8	-5.5
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
A	DOCUMATION INC	6- 9	6 7/8	- 1/4	-5.5
O	DATARAM CORP	2- 11	10 3/4	+3 1/4	+43.3
N	ELECTRONIC M & M	4- 5	3 7/8	+ 1/8	+3.3
O	FABRI-TEK	1- 2	1 1/8	0	0.0
O	GENERAL COMPUTER SYS	0- 2	1 1/8	- 1/8	-10.0
N	HAZELTINE CORP	9- 12	8 1/2	0	0.0
N	HARRIS CORP	28- 33	37 1/2	+1 1/4	+3.4
A	INCOTERM CORP	10- 13	13	+1 1/2	+13.0
O	INFOREX INC	4- 7	4 3/8	0	0.0
O	INFORMATION INTL INC	9- 14	11	+ 3/4	+7.3
O	INTEL CORP	38- 57	43 1/2	+4	+8.7
A	LUNDY ELECTRONICS	3- 4	4 1/4	+ 1/2	+13.5
O	MSI DATA CORP	6- 15	12 1/2	+1 1/4	+11.1
N	MOHAWK DATA SCI	5- 8	3 7/8	+ 3/8	+6.8
O	PENRIL CORP	2- 5	4 1/8	+ 1/8	+3.1
A	PERTEC CORP	7- 9	8 1/4	+ 3/8	+4.7
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 2	1 1/2	0	0.0
O	QUANTOR CORP	4- 5	3 3/4	+ 1/8	+3.4
O	RECOGNITION EQUIP	6- 10	7 3/4	- 1/4	-3.1
O	SCAN DATA	1- 2	1 1/8	0	0.0
O	STORAGE TECHNOLOGY	10- 18	17 1/2	+ 5/8	+3.7
O	T BAR INC	7- 13	12 3/4	0	0.0
O	TALLY CORP.	4- 6	4 1/4	+ 1/8	+3.0
A	TEC INC	7- 10	7 1/2	0	0.0
N	TEKTRONIX INC	29- 38	37 1/8	+1 1/8	+3.1
N	TELEX	2- 3	2 5/8	- 1/8	-4.5
O	WILTEK INC	1- 1	3/4	+ 1/8	+20.0

SUPPLIES & ACCESSORIES

EXCH		1977 RANGE (1)	CLOSE SEP 28 1977	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 8	6 1/4	- 1/8	-1.9
O	BALTIMORE BUS FORMS	2- 4	1 5/8	0	0.0
A	BARRY WRIGHT	10- 14	13 1/8	+ 1/2	+3.9
O	CYBERMATICS INC	1- 1	7/8	0	0.0
O	DUPLEX PRODUCTS INC	14- 19	17 1/8	- 1/2	-2.8
N	ENNIS BUS. FORMS	6- 7	6	- 1/8	-2.0
O	GRAHAM MAGNETICS	11- 17	17	0	0.0
O	GRAPHIC CONTROLS	14- 18	14 1/4	0	0.0
N	3M COMPANY	48- 36	50	- 1/8	-0.2
O	MOORE CORP LTD	26- 37	26 1/2	- 1/4	-9.3
N	NASHUA CORP	16- 28	27 3/8	+ 3/8	+2.3
O	STANDARD REGISTER	18- 23	13 3/4	- 1/4	-1.2
O	TAB PRODUCTS CO	13- 13	13	- 3/4	-4.7
N	UARCO	19- 22	19 3/4	+ 1/4	+1.2
A	WABASH MAGNETICS	10- 13	11 1/2	- 3/8	-3.1
N	WALLACE BUS FORMS	17- 21	18 1/4	+ 1/4	+1.3

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